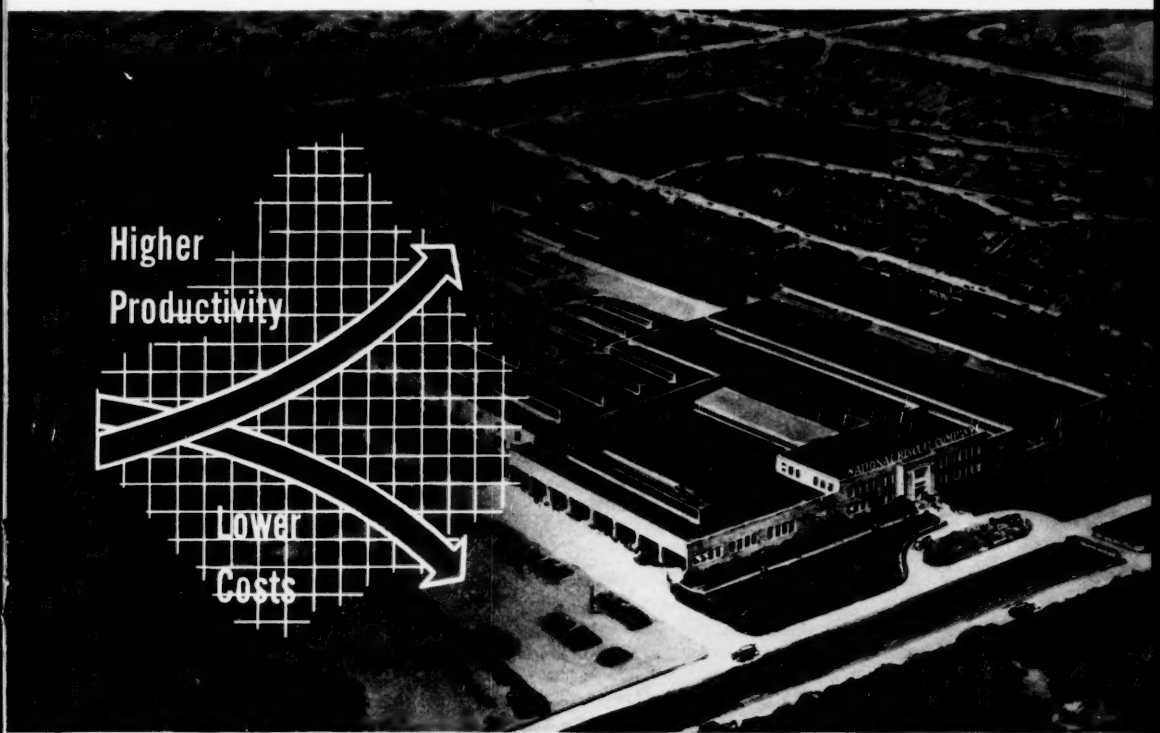
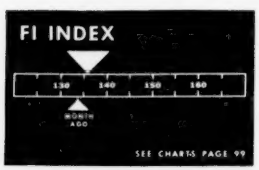
NATIONAL EDITION

Food Industries

For those who control quality and costs through management and production—a McGraw-Hill publication

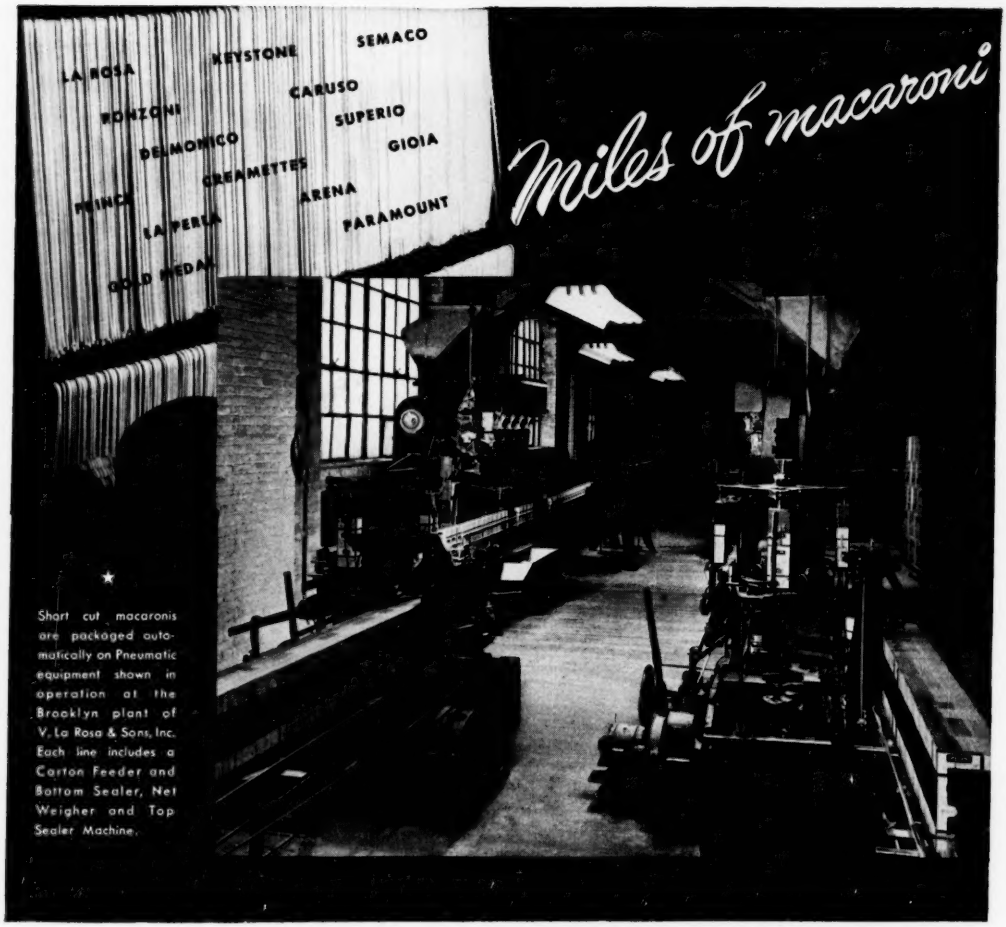


Cost cutting and increased productivity are symbolized by National Biscuit's highly efficient new plant at Houston.



OCTOBER, 1949: *Cost-Cutting Issue*

—15 feature articles on ways to reduce expenses and increase the productivity of your plant



★

Short cut macaronis are packaged automatically on Pneumatic equipment shown in operation at the Brooklyn plant of V. La Rosa & Sons, Inc. Each line includes a Carton Feeder and Bottom Sealer, Net Weigher and Top Sealer Machine.

and it's packaged by PNEUMATIC MACHINES

In every category of food – and macaroni is one important example – Pneumatic machines are the most widely used make of automatic packaging and bottling equipment, by a large margin.

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★ ★ ★

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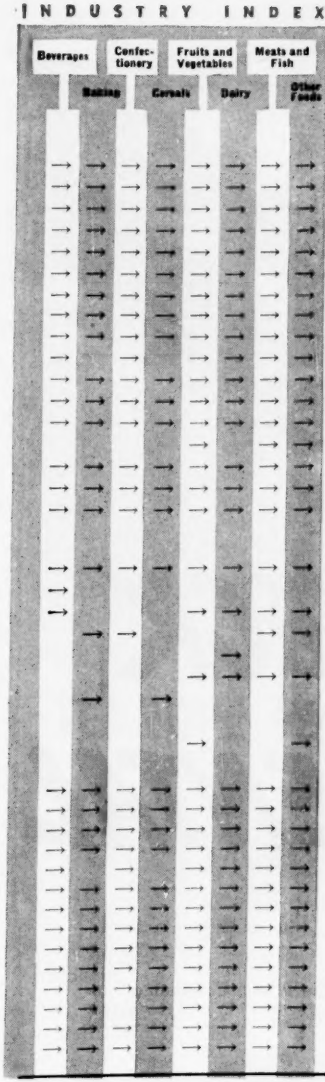

Food Industries

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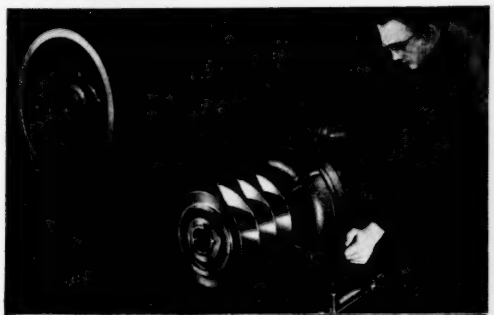
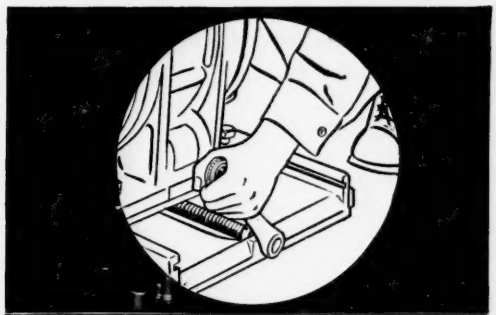


TO GO SLOWER—



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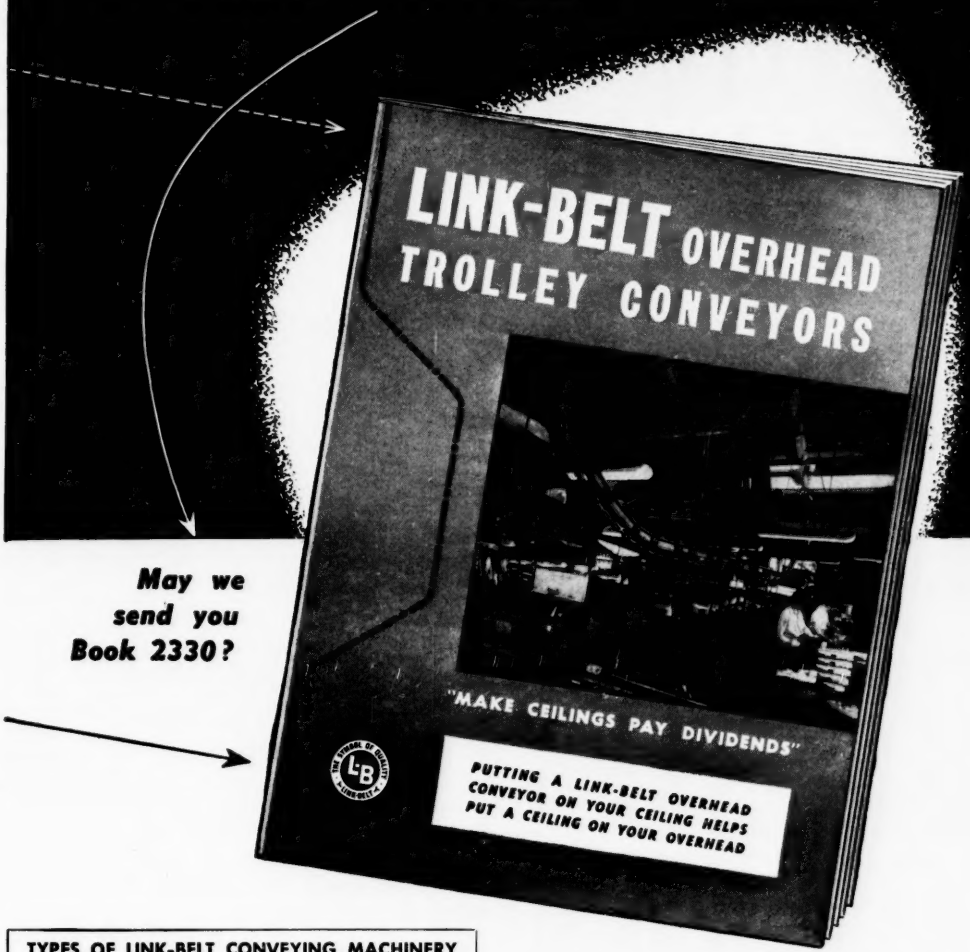
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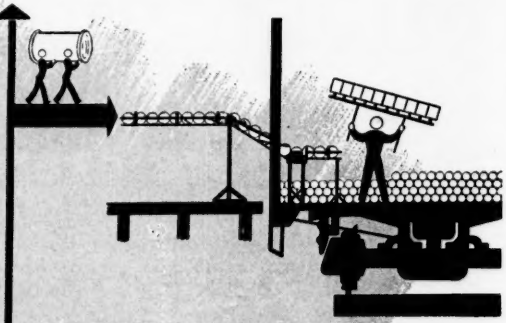
CHECK your container source for SUPPLY and SERVICE



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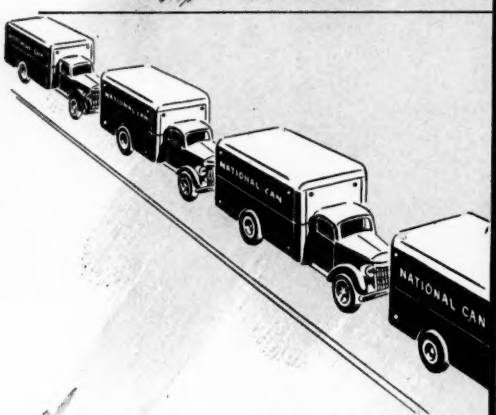

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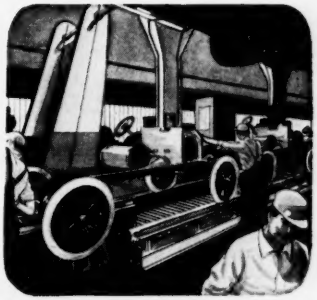
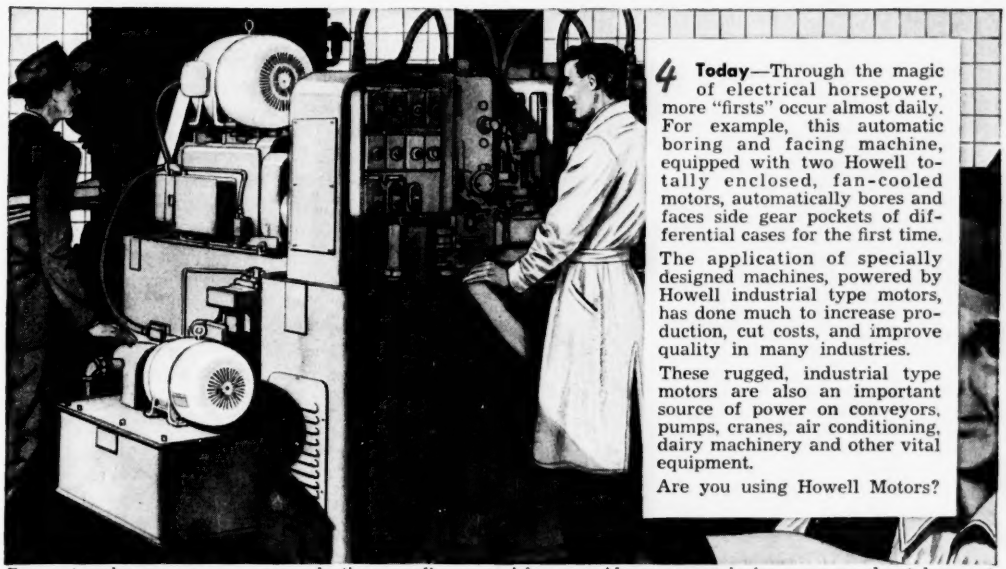
1 1875—Wisconsin offered a $10,000 reward to the person who would invent a steam carriage. George Seldon, Rochester, N. Y., was first and collected . . . America's great auto industry was under way.

2 1892—First gasoline-driven car was built by Charles Duryea with screw drivers and wrenches. Machine tools to aid this growing industry soon appeared. But parts still had to be assembled by hand.



3 1913—First moving assembly line was used in auto plants! Gone, now, was much of the labor of carrying parts. In 1915, Howell "Red Band" Motors appeared and soon were widely accepted in industry.

FAMOUS AUTOMOTIVE FIRSTS! REMEMBER?



4 Today—Through the magic of electrical horsepower, more "firsts" occur almost daily. For example, this automatic boring and facing machine, equipped with two Howell totally enclosed, fan-cooled motors, automatically bores and faces side gear pockets of differential cases for the first time.

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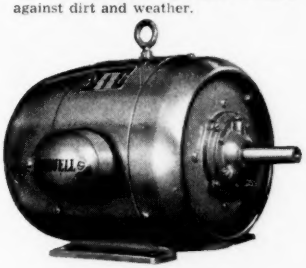
Howell totally enclosed, fan-cooled motor—windings completely sealed against dirt and weather.



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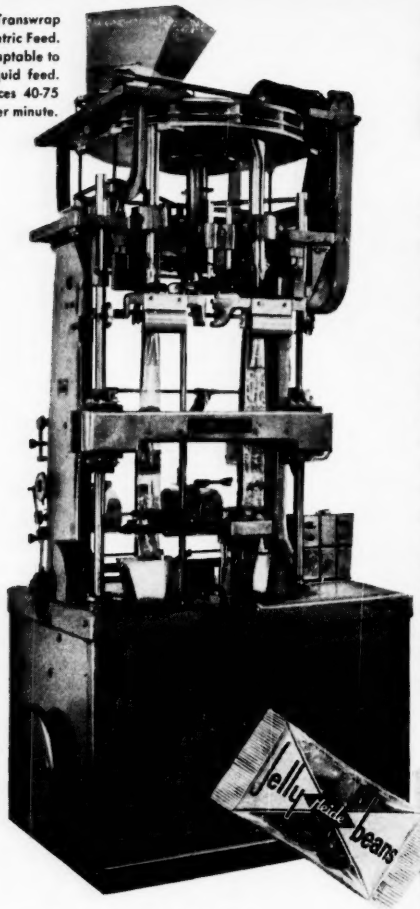

Model "B" Transwrap with Volumetric Feed. Also adaptable to auger or liquid feed. Produces 40-75 pkgs. per minute.

In one machine, TRANSWRAP is a self-contained "packaging department." Using cellophane, Pliofilm, glassine, roll foil or other suitable heat-sealing materials, it forms, fills and seals your package completely automatically.

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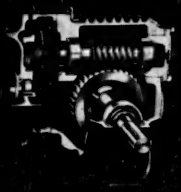

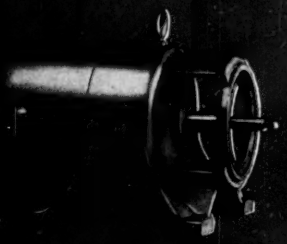

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Select the RIGHT power drive from Master's broad line and you can increase the saleability of your motor driven products . . . improve the economy and productivity of your plant equipment.

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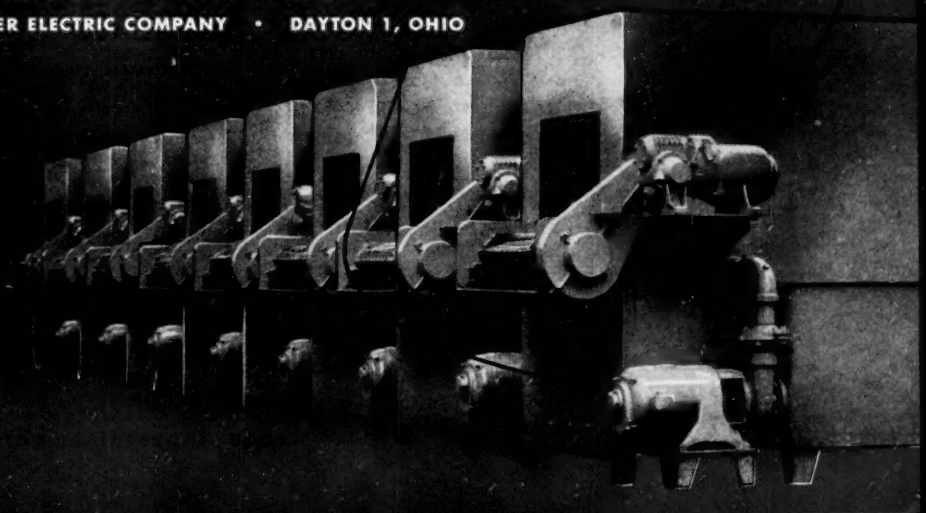

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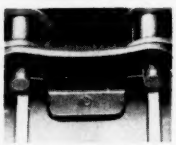
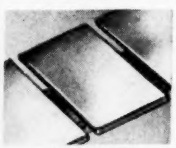
cushions and absorbs shock loads... has no hinged joints operating under tension.



ALL WELDED CONSTRUCTION
eliminates rivets, assures level top plates, makes it easy to keep chain clean.

COTTER KEYS
are on one side of chain for easy maintenance.



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- SODIUM BENZOATE PRONOUNCED HARMLESS
- OPTIMUM CONDITIONS FOR PRESERVING
- FOODS PROTECTED WITH BENZOATES
- PRESERVATION OF FISH WITH SODIUM BENZOATE
- ADDITIONAL USES OF BENZOIC ACID
- BENZOIC ACID DERIVATIVES
- NEW USES FOR BENZOIC ACID AND ITS COMPOUNDS
- TECHNICAL DATA

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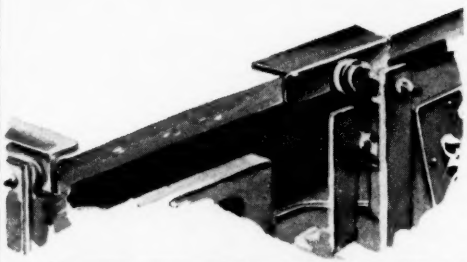
to make a plant a better plant...

The On-The-Floor Test

From the standpoint of safety, what makes the best floor surface for a plant? There have been a lot of guesses but now they *know*. A pair of "dawgs" pounding the "pavements" of an electronic stepmeter is used to measure the safety efficiency of any walkway surface. It's a sure test to find the best.



The On-The-Wall Test

From the standpoint of results and economy, what is the best paint for a plant? Again, there have been a lot of guesses . . . but there's one *sure* way to tell. Test paints *on the wall.*

Yes, compare a gallon of any good paint with a gallon of Barreled Sunlight. Thin each according to directions on the can. Paint them on a wall, side by side, and see the results. Measure the difference in yardage. Check how solidly each covers . . . and the appearance of both after drying. And *by all means,* keep close tabs on the amount of painting time required for each paint, because time means labor which represents 80% of painting costs.

It's a simple test to make. But brother, how it proves that Barreled Sunlight gives you a better looking, longer lasting paint job *for less money* than any other paint on the market.

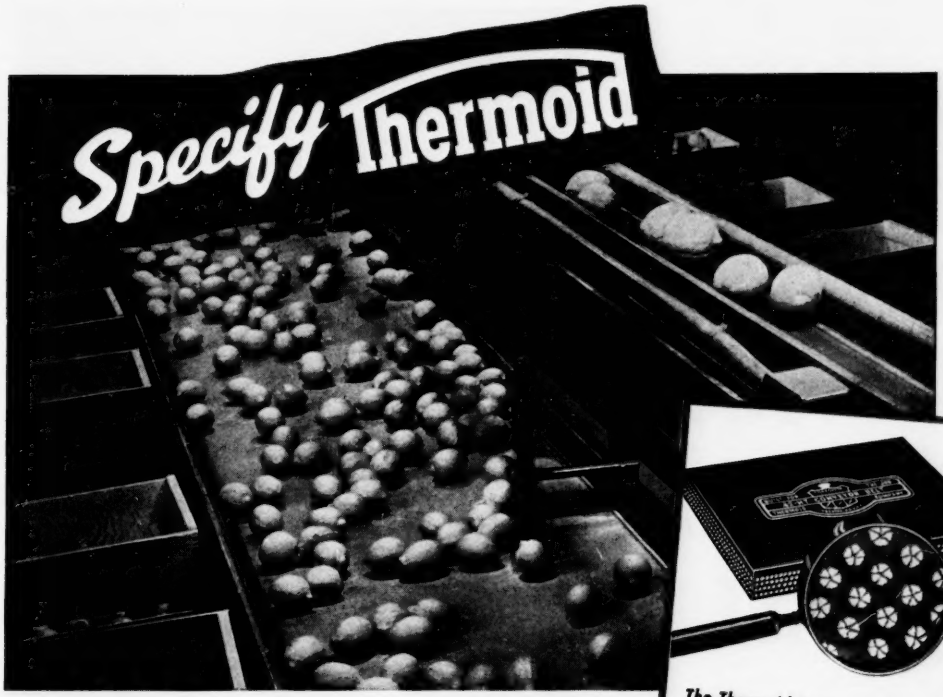
Talk it over with the Barreled Sunlight representative. Write and he'll call.

U. S. GUTTA PERCHA PAINT COMPANY
37-J Dudley Street, Providence, Rhode Island

Barreled Sunlight *Paints*

In whitest white or clean, clear, pleasing colors, there's a Barreled Sunlight Paint for every job

It always costs more not to paint!



Thermoid Impregnation Process Assures Longer Conveyor Belt Life

Thermoid Conveyor Belts are Built for the Job!

For over 68 years, Thermoid has worked with packers and canners to develop rubber products to meet the many problems encountered in food processing industries. The result—a complete line of Thermoid Conveyor Belts for every packing and canning requirement.

Your nearest Thermoid distributor can service your requirements . . . or if you prefer, write us of your problem and we will furnish full details.

It will pay you to ***Specify*** Thermoid!

Thermoid Quality Products: Transmission Belting • F.H.P. and Multiple V-Belts • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Molded Products • Industrial Brake Linings and Friction Materials.

The Thermoid Impregnation Process insures a deeper penetration of rubber between the threads of the yarn, which encases each individual strand with protective rubber. The rubber acts as a sheath between the strands and prevents the destructive abrasive action as the product is flexed in use. To obtain the required rubber penetration, the twist of the yarn must be to exact specifications. With the yarn twisted too tightly, proper penetration of the rubber compound is impossible. This condition produces abrasion, causing premature failure. On the other hand, if the yarn is twisted too loosely, the product lacks tensile strength. Thermoid has discovered the optimum twist of the yarn which assures maximum rubber penetration and greatest strength. The development of Thermoid Impregnation Process is another step forward in Thermoid's planned program of product improvement, assuring maximum service and lower operating costs to industry through the use of Thermoid Industrial Rubber Products.

Thermoid Company

Main Offices and Factory • Trenton, N. J., U. S. A.
Western Offices and Factory • Nephi, Utah, U.S.A.
Industrial Rubber Products • Friction Materials • Oil Field Products

for a greater profit margin

PACKAGE FOOD the DELTASEAL way*

It costs less to fill bags the Deltaseal way because filling and closing is faster . . . mostly automatic. There's less handling . . . more bags closed per hour.

And Deltaseal bags are easy to open. Customers just *pull, cut and pour.* The handy spout channels the food right into the measuring cup or storage container.

The Deltaseal closure gives a neat full-pack appearance and makes it easy to build attention-getting displays in stores. Your brand, printed in bright, sparkling colors adds still further to the sales-inviting appearance of the package.

Ask a Bemis representative about the economy of Deltaseal Bags and the Deltaseal Packaging System.

Bemis

"America's No. 1 Bag Maker"

*DELTASEAL BAGS plus the DELTASEAL PACKAGING SYSTEM

Deltaseal Reg. U. S. Pat. Off.

Baltimore • Boise • Boston • Brooklyn • Buffalo • Charlotte • Chicago • Cleveland Denver • Detroit • East Pepperell • Houston • Indianapolis • Jacksonville, Fla. Kansas City • Los Angeles • Louisville • Memphis • Minneapolis • Mobile • New Orleans New York City • Norfolk • Oklahoma City • Omaha • Peoria • Phoenix • Pittsburgh St. Louis • Salt Lake City • Salina • San Francisco • Seattle • Vancouver, Wash. Wichita • Wilmington, Calif.

BORG-WARNER

(INGERSOLL STEEL DIVISION)

A dependable source for

STEEL

ENGINEERING B-W PRODUCTION

Write us about your requirements

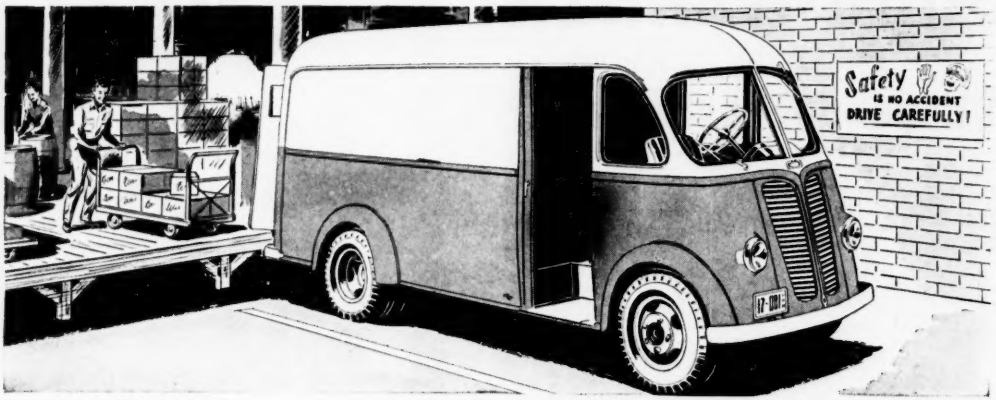
Borg-Warner operates at New Castle, Indiana, (Ingersoll Division) steel mills that roll many special steels for special uses. For example, here you will find a dependable source of—

- **STEELS that** ***RESIST CORROSION***
- **STEELS that** ***RESIST HEAT***
- **STEELS for lower cost** ***STAINLESS PROTECTION***

So when you need solid stainless, heat-resisting alloy steel, or IngAclad stainless-clad steel—write, wire or phone. Our advisory service is yours for the asking without cost or obligation.

Borg-Warner Corporation
310 South Michigan Avenue • Chicago 4, Illinois
Plants: Chicago, Illinois; New Castle, Indiana; Kalamazoo, Michigan

NEW REASONS for choosing America's most popular multi-stop delivery truck

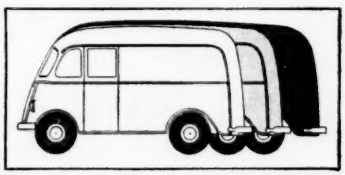


New 12-foot Metro* body offers 360 cubic feet of payload space!

Model KB-5-M, larger-size version of the unchallenged 11-year leader in the extra-capacity multi-stop delivery field, provides 360 cubic feet of load-space. Its International Green Diamond Engine, mounted in the 135-inch wheelbase chassis, develops 93 brake h.p., and meets hauling requirements up to 12,000 pounds GVW.

New range of Internationals with Metro bodies satisfies wider range of multi-stop delivery needs!

Pick the Metro body size that best meets your particular requirements. *KB-1-M*, payload space 225 cubic feet, 7¾ feet long with a GVW rating of 5,000 pounds; *KB-3-M*, payload space 280 cubic feet, 9½ feet long with a GVW rating of 7,000 pounds; *KB-5-M*, payload space 360 cubic feet, 12 feet long with a GVW rating of 12,000 pounds.



New International multi-stop chassis units fit bodies built to your own specifications!

Your body builder can quickly and easily mount bodies built to your own specifications on International chassis specialized for stop-and-start service. Each chassis comes ready for body mounting with a Metro body front-end section—windshield, front-quarter windows, dash, engine housing, and driver's seat. Available in 3 sizes: wheelbases —102, 113, and 135 inches; GVW ratings—5,000, 7,000, and 12,000 pounds.

Solve your delivery problems NOW!

Specialized International sales engineers who know delivery problems are ready to help you select the right International with Metro body to fit your needs. Call or visit your International Dealer or Branch.

International Harvester Builds
McCormick Farm Equipment and Farmall Tractors
Motor Trucks . . . Industrial Power
Refrigerators and Freezers

*Metro. Registered trade mark of The Metropolitan Body Company, Inc., subsidiary of the International Harvester Company.

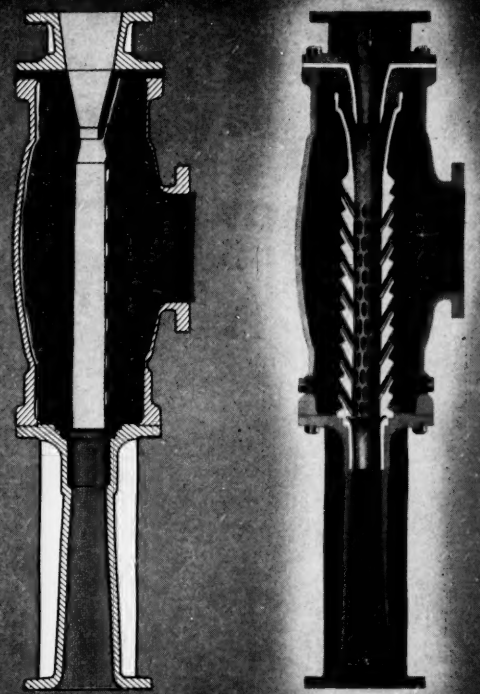
Tune in James Melton and "Harvest of Stars," NBC, Sunday afternoons

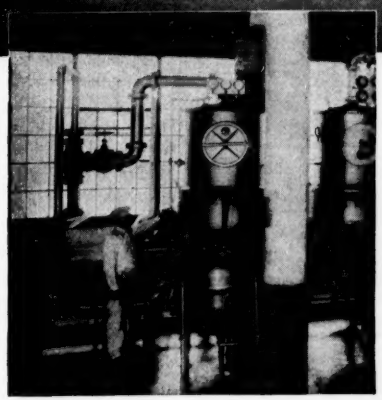
INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY • CHICAGO

Get...

THEN FORGET THIS EDUCTOR CONDENSER





Three SK Eductor Condensers, only one of which is shown, are used on vacuum kettles in the food manufacturing plant above.

The SK Eductor Condenser has no moving parts to get out of order, adjust or repair. It's simply designed to require minimum maintenance and insure efficient operation in various processes requiring medium or high vacuum. You can install it and then forget it.

In operation, the injection water is delivered to the top inlet of the condenser at a constant pressure of 10 lbs. which, combined with the internal vacuum, produces sufficient jet energy to discharge the water through the tail diffuser against atmospheric pressure. The water jet condenses the steam, entrains the non-condensible gases and discharges the mixture into a hotwell tank without the use of an external vacuum pump.

Ideal for use with small engines or turbines and in process operations in the food, chemical and refinery fields, SK Eductor Condensers are made in sizes ranging from 1½" to 10" inclusive.

You can get full details on construction and operation by requesting Bulletin 5-B.

SCHUTTE and KOERTING Company

Manufacturing Engineers

1157 THOMPSON STREET • PHILADELPHIA 22, PA.

JET APPARATUS • HEAT TRANSFER EQUIPMENT • STRAINERS • CONDENSERS AND VACUUM PUMPS • OIL BURNING EQUIPMENT • ROTAMETERS • FLOW INDICATORS • RADIAFIN TUBES • VALVES • SPRAY NOZZLES AND ATOMIZERS • GEAR PUMPS • DESUPERHEATERS

For airtight, leakproof sealing...

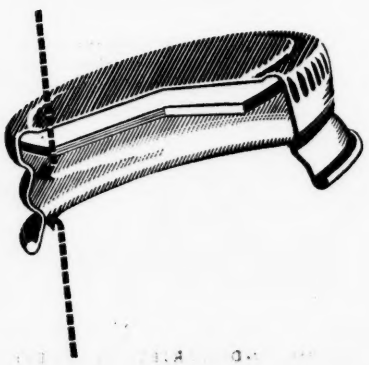
THE ANCHOR* C. T. CAP

THE *Anchor* C. T. Cap is adaptable for all products not subject to bacterial decomposition. In application the cap thread contacts the underside of the glass thread and exerts an even downward sealing pressure on the liner, effecting a uniformly tight and dependable airtight and liquid-tight seal.

Its scientifically designed deep rolled thread improves holding qualities on min. glass; permits ample clearance over glass thread, prevents binding and gives a spin-on action which results in fast, low-cost application.

In addition, its initial low cost makes the *Anchor* C. T. Cap a most economical closure to use.

*Reg. U. S. Pat. Off.



ANCHOR HOCKING
GLASS CORPORATION
Lancaster, Ohio

SPEED CASE LOADING
pack in Anchorglass* Containers

WHETHER you load cartons by hand or use modern, high-speed loading equipment that simultaneously drops 12, 24 or more filled containers into shipping cartons, you'll get peak performance with *Anchorglass* Containers.

That's because *Anchorglass* Containers are uniform, tough and strong. They result from practical engineered designs—consistency in manufacture—accurate temperature controls in annealing—strict quality control—and a constant emphasis on highest manufacturing standards.

Anchorglass Containers are available in all standard styles, capacities and finishes, in crystal, amber or emerald green glass. Let us supply samples and prices.

*Reg. U. S. Pat. Off.

ANCHOR HOCKING
GLASS CORPORATION
Lancaster, Ohio

No top-heavy v-belt inventory with VEELOS the link v-belt

4 reels of VEELOS replace 316 sizes of endless v-belts

• Why jam your stockroom with costly inventories of hundreds of sizes of endless v-belts when 4 reels of VEELOS will handle every v-belt job in the O, A, B and C widths? If you use only two widths of v-belts, two reels of VEELOS will be all you need.

It's a matter of record that *dollar for dollar* VEELOS gives the greatest value. Machine maintenance is kept low because uniform tension is easy to maintain. You install VEELOS *without* dismantling outboard bearings.

PUT THESE 7 VEELOS EXTRAS TO WORK FOR YOU...

- **Minimum Inventory**
- **Easy Installation**
- **Any Length Immediately Available**
- **Practically No Downtime**
- **Smooth, Vibrationless Power Delivery**
- **Long Lasting**
- **Matched Belts That Stay Matched**

For All the Facts and complete engineering information, measuring and installation directions—write for your copy of the Veelos Data Book.

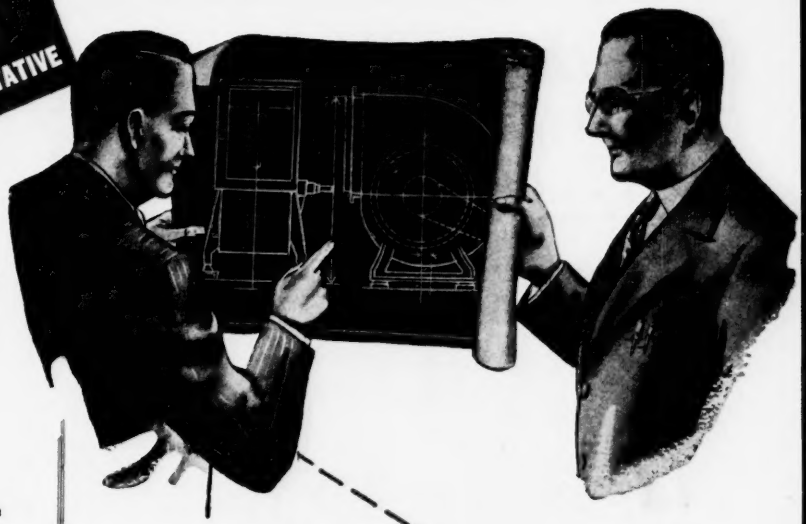
MANHEIM MANUFACTURING & BELTING COMPANY
MANHEIM, PA.

VEELOS
THE LINK
V-BELT

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

Made in all standard sizes, fits all standard grooves. Packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. Veelos is known as VEELINK outside the United States.

YOUR "Buffalo" ENGINEERING REPRESENTATIVE



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CLEVELAND 13
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Power Engineering Corp.
517 Brooks Bldg.

Call in your nearest "Buffalo" Representative—his "Air Know-How" is at Your Service

READY AND COMPETENT

to work with your consulting engineer

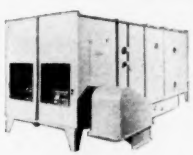
ON YOUR AIR PROBLEMS

To make your investment in air pay you maximum dividends, it's more than a matter of buying a *good* fan or a *good* air conditioning unit. In today's complex air handling problems, proper selection of equipment is often the only answer—plus an effective *link* between your own engineer and the firm supplying the equipment.

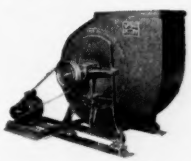
This is one of the reasons why "Buffalo" installations have been so satisfactory to users. "Buffalo" equipment, a complete line of field-proven fans and air conditioning units—*plus* the "Buffalo" representatives at left—give you this ideal combination.

"Buffalo" representatives know their equipment and the jobs it is designed to handle. They are Graduate Engineers with one to five years of factory training, in addition to wide field experience. And they have all the resources of the "Buffalo" home plant engineering staff to back them up.

Buffalo Air Conditioning Cabinet



Buffalo Air Washer



Buffalo Limit-Load Fan

"Buffalo" FIRST FOR FANS

BUFFALO FORGE COMPANY

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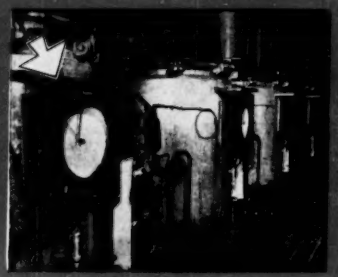
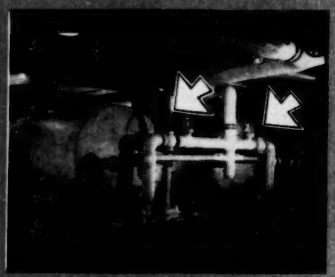
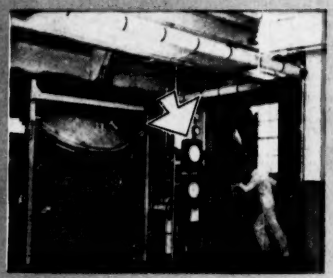
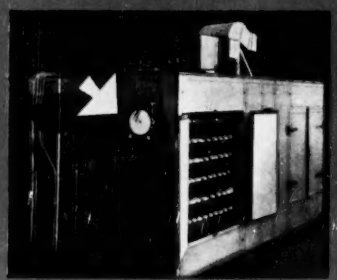
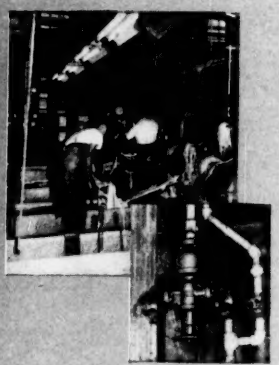
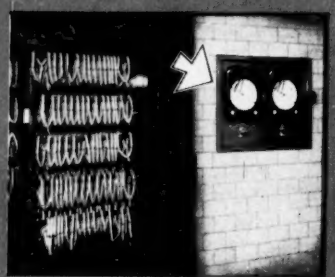
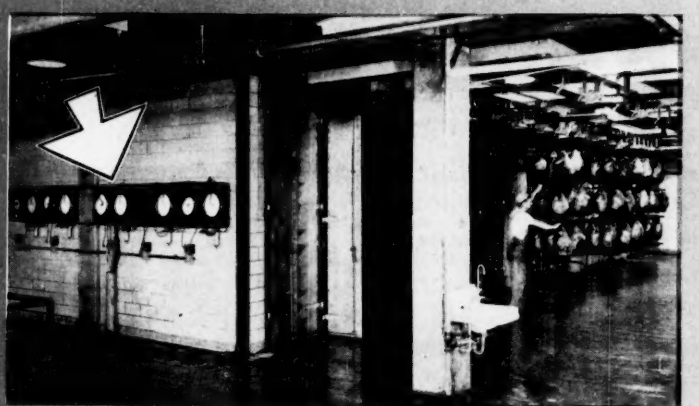
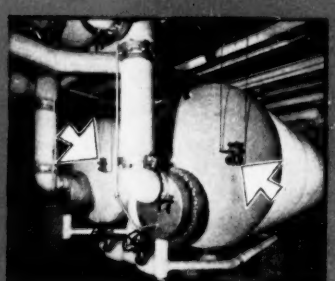
VENTILATING FORCED DRAFT | AIR WASHING COOLING | AIR TEMPERING HEATING | INDUCED DRAFT EXHAUSTING PRESSURE BLOWING

Reduce Costs...

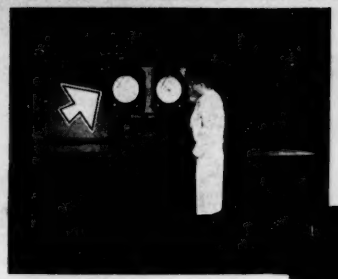
Get BETTER Quality Products ... BIGGER Profits

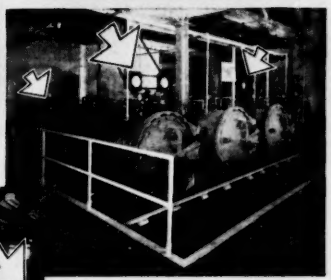
WITH **POWERS** CONTROL

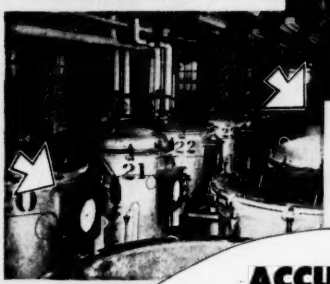





58 Years of Temperature and Humidity







ACCURATE TEMPERATURE and HUMIDITY CONTROL

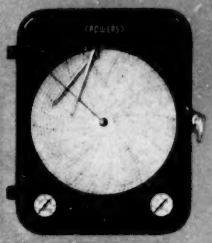
of processing operations increases plant efficiency and pays a big return on the investment.

If you have a problem selecting the right type of control for a process, process room, water heater or hot water line control, why not contact our nearest office? There's no obligation. With a complete line of self-acting and air operated regulators and 58 years of experience we may be able to help you select the proper type for your requirements. Phone or write to: THE POWERS REGULATOR CO., 2725 Greenview Ave., Chicago 14, Ill. • 231 East 46th Street, New York 17, N. Y. • 1808 W. Eighth St., Los Angeles 5, Calif. • 195 Spadina Ave., Toronto, Ontario. MP 3

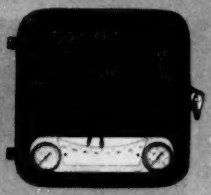
OFFICES in 50 CITIES See your Phone Book

Control

SOME OF THE MANY TYPES OF POWERS CONTROL

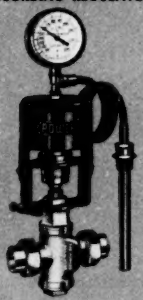


SERIES 100 RECORDING REGULATOR



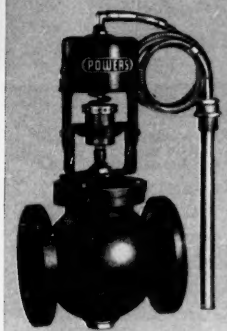
SERIES 100 INDICATING REGULATOR

No. 10 REGULATOR

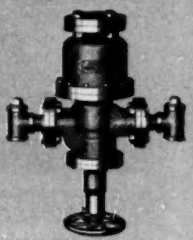


No. 11 INDICATING REGULATOR Self-Operating

TYPE K REMOTE BULB THERMOSTAT

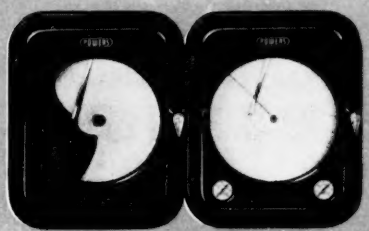


No. 11 REGULATOR



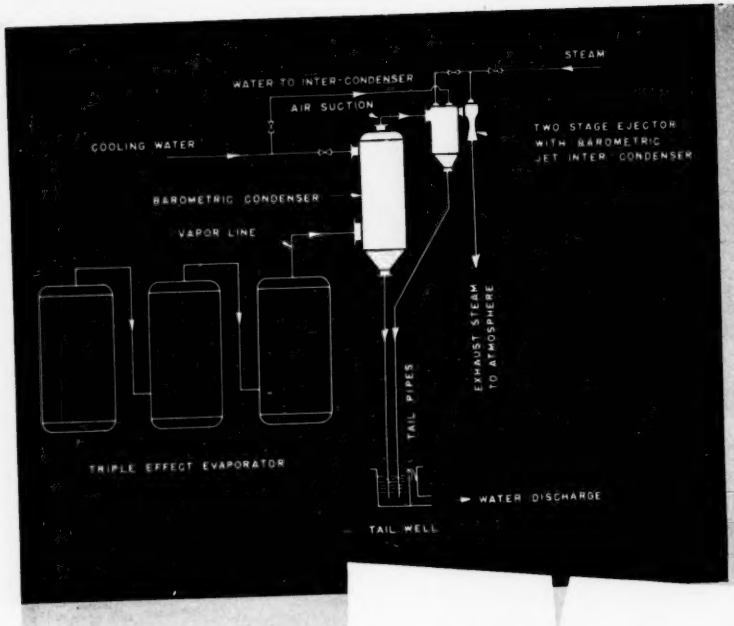
THERMOSTATIC WATER CONTROLLER

STATIC PRESSURE REGULATOR



TIME CYCLE RECORDING REGULATOR

POWERS



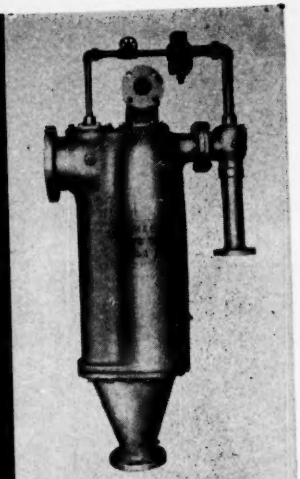


Diagram shows Barometric Condenser and Two Stage Tubejet, pictured above, with Barometric Inter Condenser serving a Triple Effect Evaporator.

Applications

DRYING
DISTILLING
REFINING
COOLING
DEHYDRATION
DEODORIZING
FILTERING
IMPREGNATING
EVAPORATING

and

VACUUM REFRIGERATION

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(C. H. Wheeler equals High Vacuum Satisfaction)

You know what vacuum you want and C. H. Wheeler engineers know how to get it, using standard C. H. W. Tubejet ejectors, boosters and C. H. W. Inter and/or After Condensers of Barometric or Surface Type.... A specified vacuum can often be obtained in several ways, that is, by several combinations of standard equipment. The problem thus becomes one of engineering your conditions, and C. H. W. equipment, to obtain the desired vacuum in the most economical manner.... Because of long experience in vacuum engineering, probably no problem is new to C. H. Wheeler, thus C. H. W. guarantees of vacuum and performance carry an extra assurance of satisfaction in that "your problem or one similar has been solved before." Catalog on request.

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STEAM CONDENSERS • WATER COOLING TOWERS
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INCREASE your products' sales appeal with increased taste appeal

Learn how Staley's Monosodium Glutamate brings out and "fixes" full, natural food flavor for full consumer enjoyment

A simple test will quickly prove how Staley's 99+% pure monosodium glutamate, the amazing, natural food ingredient, can enhance the full, *natural flavor* of such processed foods as canned soups, canned poultry, meats and sea foods, vegetables, seasoning, sauces and other foods. This wonderful flavor-booster works equally well whether finished product is frozen, dehydrated or canned.

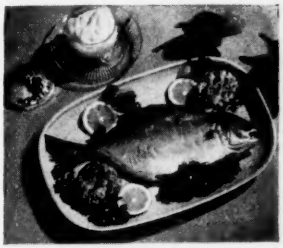
As easy to use as salt
. . . a little goes a long, long way!

Do not confuse Staley's GLUTAMATE with flavoring agents, spices, normally used seasoning materials or costly *blends* containing small amounts of monosodium glutamate. As little GLUTAMATE as 0.05 to 0.5% of the weight of the food to be flavor-enhanced, will bring out and HOLD the full, natural deliciousness of your product right up to the day it reaches the family table.

Order a trial sample of Staley's GLUTAMATE today. Put it to the test in your own plant. It requires no change in basic formulae. See how effectively and inexpensively it improves sales appeal through improving *taste-appeal*. Descriptive literature and the services of our technical staff are yours for the asking. Use handy coupon below.

A. E. STALEY MANUFACTURING CO.
DECATUR, ILL.

'Add Staley's GLUTAMATE to liquid or dehydrated soups.



Add Staley's GLUTAMATE to processed or frozen fish.

Add Staley's GLUTAMATE to processed or frozen meats.

Add Staley's GLUTAMATE to processed or frozen vegetables.

A. E. Staley Manufacturing Co.
Industrial Sales Department
Dept. FI-10, Decatur, Ill.

☐ Please send us one-pound trial order of Staley's Glutamate at your special introductory price of $1.56 (postage prepaid).

☐ Check enclosed. ☐ Invoice us.

☐ Please send us more information on Staley's Glutamate.

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STALEY'S GLUTAMATE produced under exacting laboratory control in new $2,500,000 plant.

"Good packaging starts with ENGINEERING"

Says
C. A. SOUTHWICK, Jr.
(Packaging Engineer and Technical Editor of "Modern Packaging")

The men who engineer sales-winning packages know that product protection is one of their most important functions. They know from long experience that repeat sales depend on whether a product reaches the customer in good condition, with all its pleasing qualities intact.

Check the sales leaders in field after field and you will find well-engineered packages . . . and over and over again, you will find a Riegel paper inside for product protection. Many other Riegel papers are designed for flexible packages, for laminates, for outer wraps and for almost every requirement in protective packaging.

Tell us your needs, and we believe we can offer you a paper that will do your job . . . efficiently and economically.

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Riegel *Tailor-made Papers for Protective Packaging*

Select the Correct

Century MOTOR

For Your Liquid Pumping and Refrigeration Requirements

- Get Top Performance
- Long Motor Life

Century's wide range of types, kinds and sizes assures motors that exactly meet the power requirements of your equipment.

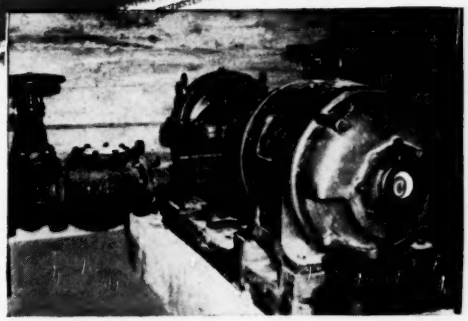
Whether the application is a centrifugal pump or an unloaded compressor, deep well pump or compressors started under full load—there is a motor available in single phase, polyphase or direct current.

Drip-proof, splashproof, totally enclosed fan cooled and explosion-proof frames are available to protect the vital parts of the motor against any kind of hazardous atmosphere.

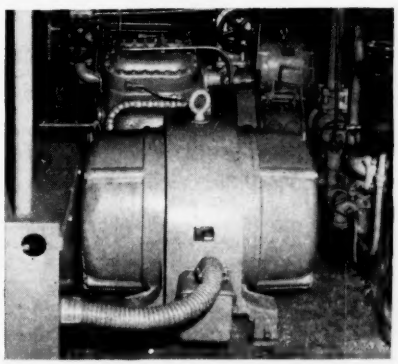
UNSEEN because they are sealed-in—many thousands of integral and fractional H. P. Century Hermetic Motors have been successfully serving the Refrigeration Industry for fifteen years.

Century builds a complete line of electric motors in a wide range of types and kinds, in sizes from 1/6 to 400 horsepower.

Specify Century motors for all your electric power requirements.



● 150 horsepower Century motor driving a water pump for a large central station.



● 50/25 horsepower Century splashproof motor driving a refrigeration compressor in a bottling plant.

Century Motors

Popular types and ratings are generally available from factory and branch office stocks.

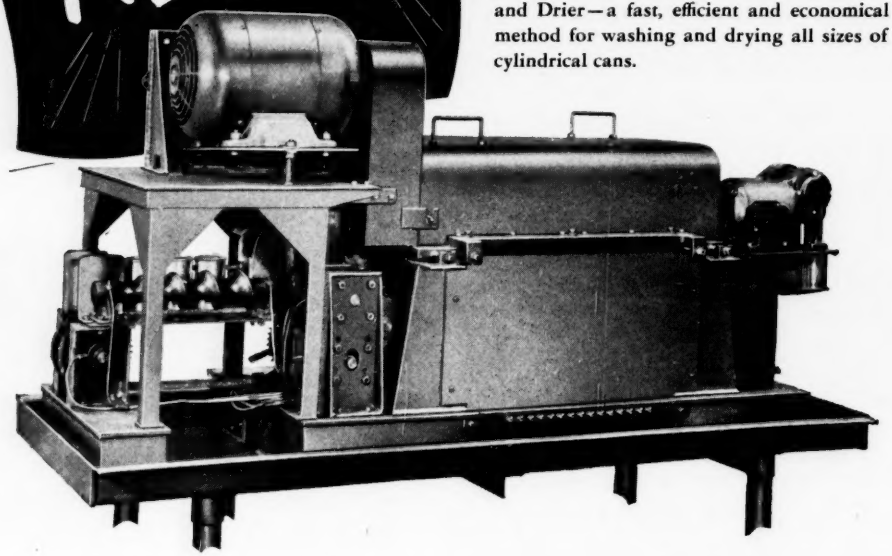
-610

CENTURY ELECTRIC COMPANY • 1806 Pine St., Saint Louis 3, Missouri

Offices and Stock Points in Principal Cities

REX Roto-Brush Can Cleaner and Drier

Here's the modern answer to an old canning problem. The Rex Roto-Brush Can Cleaner and Drier—a fast, efficient and economical method for washing and drying all sizes of cylindrical cans.



5 Big Advantages—To You

1 ***Improves Product Appearance***
The Rex Roto-Brush Can Cleaner and Drier assures you a clean and shiny package for your product—gives you positive product appeal. No more unsightly, stained cans on store shelves that the housewife passes by.

2 ***Simplifies Labeling Problems***
Labels adhere better to dry, clean cans. Eliminate "rejects" caused by damaged or missing labels. No more production jams due to failure of labels to stick.

3 ***Saves Space***
Eliminates long, air-drying conveyor lines. Use this valuable space for other operations. The Rex Roto-Brush Can Cleaner and Drier fits into a 3′ x 7½′ space.

4 ***Saves Time***
The whole cleaning and drying process takes only a few seconds. Cans proceed to next operation at speeds up to 300 per minute.

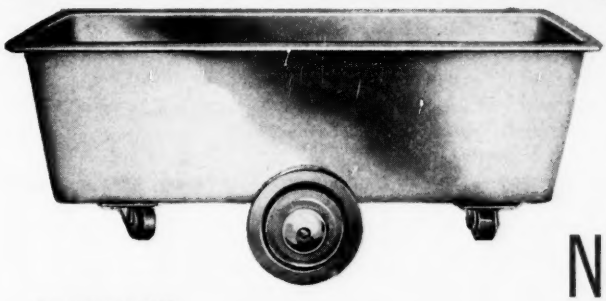
5 ***Durable, Dependable, Economical***
Machines are built to famous Chain Belt quality standards to withstand years of steady operation. Brushes in test machines are still in good condition after over a year of service. Machines are entirely automatic—no operator required. Only operating cost is for electric power.

The Rex Roto-Brush Can Cleaner and Drier may be exactly what you've been looking for to modernize your canning line . . . help increase your sales. Our new booklet gives you all the details. Just ask your nearest Chain Belt Representative about it or write the Chain Belt Company, 1616 W. Bruce Street, Milwaukee 4, Wis.

CHAIN BELT COMPANY — REX — FOOD PROCESSING EQUIPMENT

Employees like this easy-to-handle aluminum equipment

Light-in-weight Wear-Ever aluminum equipment brings cheers from the men who work with it, for it means less fatigue. It brings cheers, too, from those responsible for efficiency and *operating* costs. For the super-tough alloy from which Wear-Ever aluminum food equipment is made resists gouging and denting—gives many extra years of hard service. Mail the coupon below for full information on Wear-Ever Aluminum food plant equipment. The Aluminum Cooking Utensil Co., Wear-Ever Bldg., New Kensington, Pa.



FOOD TRUCKS

Strong aluminum body. 14 cu. ft. capacity. Continuous welds eliminate cracks and crevices. St. John Neotread wheels.

NEW **SEAMLESS CONTAINER**

Available in 5, 10, 15, 20, 30 and 50 gal. sizes, with or without handles.

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Aluminum

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The Aluminum Cooking Utensil Co.
310 Wear-Ever Bldg., New Kensington, Pa.

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☐ Tubs ☐ Pails ☐ Food Trucks
☐ Ingredient Containers ☐ Complete Line

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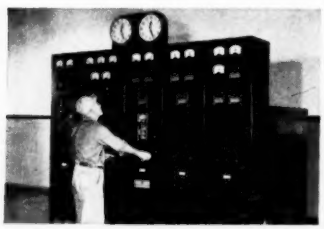
electrically co-ordinated to process beets —at 2 tons a minute!

New $5,500,000 beet sugar plant looks to electric equipment supplied and engineered by General Electric to help maintain high processing output.

The American Crystal Sugar Company's new plant at Moorhead, Minnesota, is another example of an electrical system equipped and co-ordinated almost entirely by General Electric. Playing an indispensable part in the plant's high output of granular and powdered sugar and dry beet pulp, this G-E system needs little or no maintenance attention, helps cut over-all processing costs!

Whatever the food you process or the size of your plant, you, too, can profit by discussing your electrical needs with a G-E industry specialist. From a complete, integrated plant system geared to continuous processing, to motors and control for a single operation, his advice can be counted on to help quicken production, cut costs. Call him today at your nearest G-E office. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

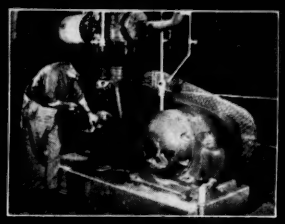


1 The Moorhead plant, put into operation last fall, has a G-E Turbo-Alternator with a power capacity of 2500 kw. Shown here is G-E Metal-Clad switchgear with 4 magne-blast air circuit breakers, rated at 600 amperes, 4160 volts. Units are completely metal-enclosed for personnel safety. Bulletin GEA-3083.

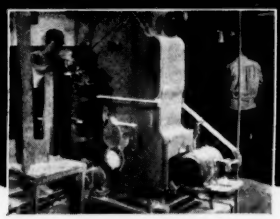
2 Four G-E unit substations (one shown here) are placed in load center areas throughout the plant to step down power from 4160 volts to 440 volts right where it's needed. This eliminates voltage drop caused by long, low-voltage feeders. Compact and space-saving, G-E unit substations are quickly, inexpensively installed. Bulletin GEA-3758.

3 Controlling Tri-Clad ® motors on scrolls, agitators and pumps are these two G-E Cabinetrol ® equipments, providing centralized low-voltage motor controls in compact, factory-assembled "packages." Rigid steel enclosure protects workmen, keeps out dust. Bulletin GEA-3856.

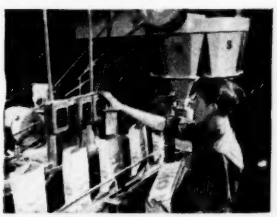
GENERAL ELECTRIC



4 About 85 per cent of the motors in this new plant are of Standard G-E Tri-Clad construction, triply protected against physical damage, electrical breakdown, and operating wear and tear. This Tri-Clad open drip-proof motor drives one of the plant's air compressors. Bulletin GEA 3580.



5 At locations such as this where motor operation might be affected by powdered or granular sugar, the new plant uses G-E totally enclosed fan-cooled motors. This one drives a 100 lb. valve bag machine for sacking granular sugar. Bulletin GEA-4400.



6 These three G-E Type CR-1062 switches on the 5-lb. sacking line control the filling turret and conveyor, the spanker, and the scale. Used for small single and three-phase motors, these compact switches provide complete protection against injurious overload conditions.

GE

Electrical systems for food plants

NEW—

A COST-SAVING SERVICE *for motor users!*

Here's a new way for you to cut motor repair costs, machine downtime, spare-motor inventories. With General Electric's Tri-Clad Motor Exchange Plan, you can now replace an ailing motor without long, costly production delays.

The plan is simple

All you have to do is call your regular motor supplier. Quickly, without red tape, he exchanges your inoperative motor for a factory-reconditioned motor of the same type and rating, with a new-motor warranty.

The cost is low

You can exchange motors less than a year old free of charge. Those with from one to five years of service are exchanged at a small fixed charge. For motors over five years old, the fixed charges are slightly higher.

The exchange plan now includes Tri-Clad Type K, KC, and KCJ standard general-purpose motors from 1 to 5 hp—covering many food plant needs—and will soon be extended to other Tri-Clad types. See Bulletin GEA-5189.

WANT MORE DATA?

General Electric Company, Section B652-3
Apparatus Department, Schenectady 5, N. Y.

Please send me the following bulletins:

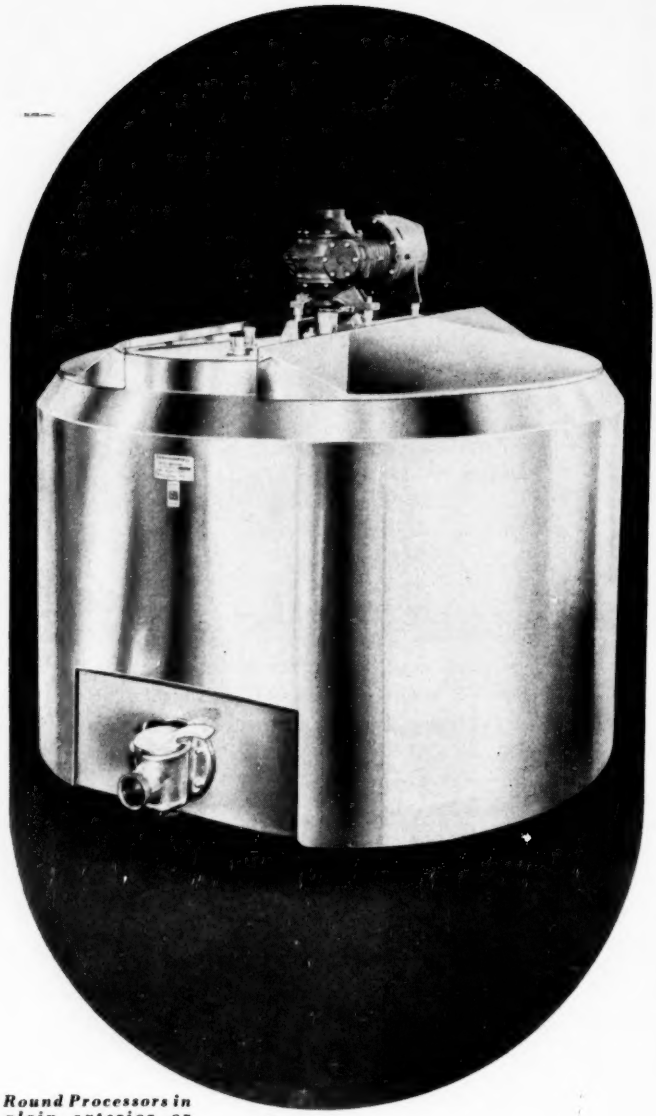
- ☐ GEA-3083—Metal-Clad Switchgear
- ☐ GEA-3580—Tri-Clad open drippproof motor
- ☐ GEA-3758—Load center unit substations
- ☐ GEA-3856—Cabinetrol
- ☐ GEA-4400—Tri-Clad totally enclosed motor
- ☐ GEA-5189—Tri-Clad motor exchange plan

Name .....

Company .....

Street .....

City ..... State .....



Round Processors in plain exterior or De Luxe, all-stainless models available in 300, 500, 600, 800, and 1000 gallon sizes. Many features of Round Processor design are protected by patents.

This processor plays no favorites!

MILK, buttermilk, chocolate milk, sweetened condensed, ice cream mix—the Cherry-Burrell Round Processor handles them all. The Round Processor assures fast heating, positive agitation, complete mixing, and efficient cooling of the product.

Sanitary? Yes. The interior is of stainless steel, smooth, accessible, easy to clean and keep clean. The design is planned for sanitation, too, by elimination of stuffing boxes, rotary seals, etc.

Ask your Cherry-Burrell representative for complete details on the Round Processor. He'll help you get advantages in economy and better products today, with this equipment which will easily fit into your plans for tomorrow. Call him now.

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427 W. Randolph Street, Chicago 6, Ill.

Milk and Food Plant Equipment and Supplies

FACTORIES, WAREHOUSES, BRANCHES, OFFICES OR DISTRIBUTORS AT YOUR SERVICE IN 56 CITIES

trendmaker in a great industry

Food Industries

OCTOBER, 1949

Invest in Efficiency and Insure Your Profits

What are you or your employer operating a business for, anyway? The principal reason is to make a profit—a worthwhile profit.

Stated so bluntly, the profit motive may sound shockingly common and coldly commercial. Maybe your public would prefer to hear that you are in business to render a service—to produce products which satisfy the buyers' wants at a popular price.

Or perhaps the farmer would want to think you are doing him a vital favor by paying him well for raw materials and then creating a market for these by preserving them or converting them into appetizing and salable form.

And your workers will like you more if you make them understand that you run your business to give them jobs and a rate of pay which maintains a high living standard for them and their dependents.

Lastly, your stockholders will appreciate the viewpoint that you run a business which puts their money to work in constructive channels and pays them a proper return in dividends.

Well, you can with pride and a clear conscience tell each of these groups what they would like to hear. Because these things will be true if you are running your food processing business right. But still, the principal goal in your business life is to make a worthwhile profit. And that must always be uppermost in your mind.

For if you fail to make a profit for any appreciable length of time, then you cannot render any of the services which please the consumer, the farmer, the worker and the stockholder.

You can't because your business either will fold up or become so poor that it cannot pay for progress and therefore cannot maintain its services on a level with those of other and more prosperous companies.

Now how do you go about making a profit—not only this year but next year, the year after, and so on indefinitely? If your plant and your methods are up to date, you may do all right this year, and possibly next. But you can't just go on turning the same wheels on the same machines, nor following the same business methods.

And why not? Because your more progressive competitors will be able to lower their costs and drop their prices to a point where either your sales volume drops or your profits disappear.

So to make the all-important profit in the future, you must invest in efficiency today and tomorrow. This investment may take two forms:

One is the expenditure of intelligence for the improvement of non-mechanical phases of the business, such as management methods, employee morale, and distribution technics. The other is the spending of money to save money in operations involving plant and equipment.

Expenditure of mental effort in work simplification studies, for example, can result in increased productivity and lower unit costs all along a production line. Or the expenditure of $20,000 for say, new packaging machines may save enough money to pay for the equipment in a year or less and contribute to profits for quite a while thereafter. And as a bonus, over and above cost cutting and increased productivity, such investments usually increase your plant capacity.

It pays to invest liberally in efficiency—to expend brain power and hard cash to save money. This is true in all types of business. But it is especially important in the food processing field—where competition is extremely keen, where surpluses are developing to depress prices, and where the average profit margin of 3 cents on the sales dollar is too slim for comfort.

Remember, too that savings from investments in efficiency have a tendency to pyramid. The first savings can be used to buy still greater savings as progress is compounded. That's how little companies grow into big ones over the years—death and taxes permitting.

—F. K. LAWLER, *Editor*

P. S.: Because of the currently wide and intense interest in lowering costs and raising productivity, FOOD INDUSTRIES *has assembled from many companies and authorities in the field quite an array of how-to-do-it information. A large part of this issue is devoted to the subject.*

The Talk of the Industry

Camouflage for Price-Support Costs

Secretary Brannan has tipped his hand. He has been pointing the finger at the terrifically high cost of buying surplus farm products under the present price-support law.

The Secretary is wise enough to know that the egg and other farm-support costs soon will begin to smell. And the odor will be particularly nauseating to taxpayers who come to realize that they are spending billions to keep their own food prices unreasonably high.

But suppose the Brannan Plan were adopted. Then the retail prices of eggs and other perishables would drop via the route of supply and demand. So taxpayers could be told that the saving in their food bill more than makes up for the tax money used to maintain farm income at parity.

But if farmers are to receive a specified price for each dozen eggs produced, the cost to the country is the same whether consumers pay the full price directly or pay only a part of it and let the government dish out the remainder.

We prefer to pay as we eat rather than have a 12-month food bill come due on March 15. Better still, let the government get out of the egg- and vote-buying business.

New Business—Formulas for Babies

Now we have custom preparation and bottling of formulas for tiny infants. Started a year and a half ago in Brooklyn, the Infant Formula Laboratory Service hit its stride this summer with five hospitals and 400 families on its customer list.

Formulas are prepared as per instructions from an infant's physician and delivered daily in sterile nursing bottles, ready to warm and serve. A bottle of sterile water, also sterile empties for orange juice and such are included. If provided with a customer's house key, the deliveryman puts the formulas in the refrigerator.

Any future in this? Who knows? But remember how the diaper service caught on.

Rat-Repellent Coating for Cartons?

No longer is there any reason for packaged foods to be damaged by rats in warehouses. There isn't, that is, if it proves practicable to follow a suggestion by Clifford A. Hampel, supervisor of inorganic technology at Armour Research Foundation of Illinois Institute of Technology.

Here's the trick: Coat the outer surface of paper-board shipping cartons with sodium fluosilicate, believed to be an effective rat repellent. The chemical might even be incorporated in the paperboard itself. These possibilities now are being precisely evaluated by the U. S. Fish & Wildlife Service.

All this stems from a four-day test during which rats refused food containing very small quantities of sodium fluosilicate.

This chemical is an irritant to warm-blooded animals, but has not been considered a dangerous poison. In fact it was used in Europe prior to World War I, as a food preservative, an application prohibited by F&DA.

Could be—health officials permitting—that brother rat is about to have packaged foods stricken from his multi-million dollar menu.

Packer Borrows Oil Process

Something new and significant in the way of valuable byproduct recovery is being undertaken by John Morrell & Co., Ottumwa, Iowa. This well-known meat packing firm has borrowed a page from the book of progressive vegetable oil processors. It is using solvent extraction to recover fat from waste meat scrap. Trichlorethylene is the solvent. This is a colorless non-flammable liquid which boils at about 180 deg. F. and is insoluble in water.

Recovering something valuable from waste is one of the surest ways to reduce overall costs.

Cleaning Fluid Used in Sterilizer

Always looking for new and better ways to process canned foods, the progressive H. J. Heinz Co. has come up with an interesting development. It has a sterilizer which uses perchlorethylene instead of steam as the heat-transfer medium. This chemical has a high boiling point of 249.8 deg. F., against water's 212 deg. F., and its specific gravity is 1.63. It is a colorless, non-flammable liquid, used as a dry cleaning and degreasing agent.

By using this liquid, temperatures high enough to process practically any canned food can be attained with very little pressure. Nice trick.

Hors d'Oeuvres

■ All of a sudden USDA discovered that the 1948 "Chicken of Tomorrow" was yesterday's baby. So now they are working on another three-year contest to end in 1951. USDA's going to pin down tomorrow somewhere, or bust.

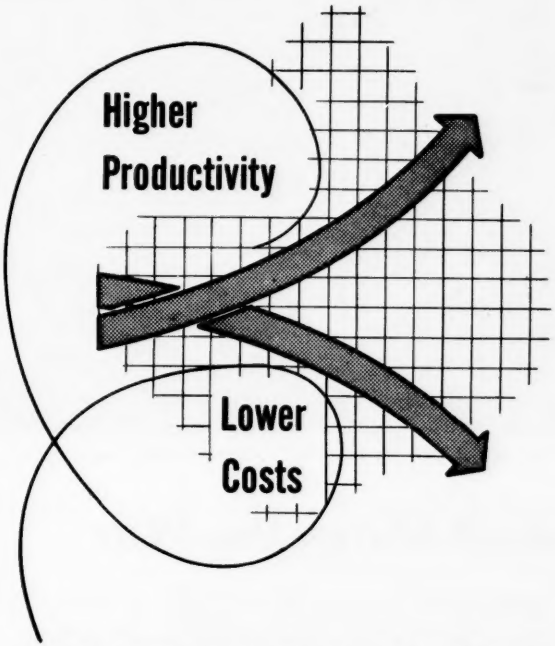
■ *Wall Street Journal* relates that bread wrappers can be impregnated with "that fresh from the oven" odor and that the "synthetic aroma of fresh baked beans" has been developed in labs. Just pack an atomizer in the can and your raw materials problems are solved.

■ The greenish tinge of tree-ripened California Valencia oranges is something the California Fruit Growers Exchange can't just ignore. The fruit is okay, but the tinge has the scientists baffled. So CFGE is making use of "The Green Tinge Mystery" as a promotion stunt. Sometimes Florida growers must just stomp up and down in frustration.

■ Progesterone, once considered the exclusive property of female mammals, put in the blood to bring their young to live birth, has now been found in chickens. And not only in hens either. Roosters come up with the stuff too. Must give capons quite a snicker.

■ Government made a profit of $970,000 supporting corn, rice, wheat, dry edible beans and 15 other farm commodities, according to a compilation by *Farm Journal*. There were some losses, too: Peanuts, $11,279,000; dried liquid and frozen eggs, $1,303,000; potatoes, $162,501,000; sugar beets, $4,501,000—to name a few. Support business might not be good, but there's lots of it. **J.A.J.J.**

SPECIAL FI "HOW TO" REPORT



EFFICIENCY ROUNDUP

Presented here as a service to readers is a variety of ideas from industry. They work for others. Many can work for you

"INVEST in Efficiency and Insure Your Profits"—the subject of our lead editorial—is not idle talk. We back this up with fifteen "how to" articles on the following pages (see list at right).

There is nothing theoretical about the many cost-saving ideas and methods presented. They are being applied successfully in the food industries.

These articles are presented as a service to readers. The purpose is to help each of you achieve that all-important goal of higher efficiency by investing mental effort in improved methods and by spending money for better plant and equipment which will save you money in the months and years ahead.

Many more articles of this type will appear in subsequent issues. —THE EDITORS

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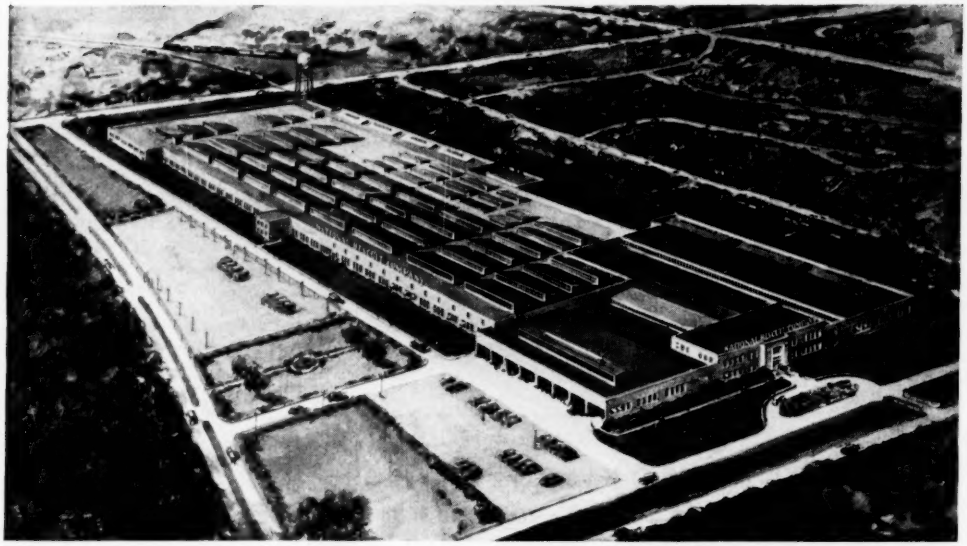
Factories designed for straight-line production . . .



"FINEST BAKERY in Southwest," new Houston cracker plant is efficient straight-line factory.

National Biscuit Shows the Way

Demonstrates how a processor can go all-out for efficiency. Company has adopted enlightened business policies and developed advanced methods

F. K. LAWLER
Editor of Food Industries

If you want a specific example of how a food company can go all-out on a cost-cutting and increased productivity program, take National Biscuit Co. Other companies are doing a good job, too. But the biscuit company has done so much beyond the pale of secrecy that it is almost without parallel.

The story of NABISCO's revitalization starts about four years ago with the election of George H. Coppers as president and the more recent appointment of Russell M. Shultz as vice-president in charge of operations. These men and their associates broke with the old and traditional practices and adopted enlightened business philosophies and policies which are the foundation of their company's recent splurge of progress.

Here are several of them:

1 You have to spend money to make money. National Biscuit's goal is a 50 percent reduction in five years in the direct costs of baking.

2 The company intends to complete the mechanization of the biscuit business through an all-out attack on the industry's dated production techniques. Speaking in general terms, the processes have not changed importantly in more than a generation. Mr. Shultz puts it even more strongly in respect to the production of iced and coated cookies: "There hasn't been a new thought in 40 years."

3 Opportunities for more efficient materials handling are very great. So great that company engineers working on experiments in more efficient materials handling are told to ignore the development cost. Bulk flour handling equipment is being installed, and bulk shipping facilities are under development.

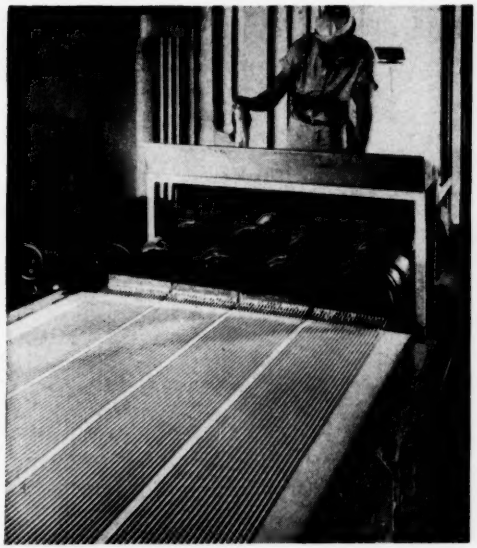
4 Consultants are employed freely to help the company speed the development of better management and distribution methods. No less than $180,000 was spent for such help in a three-year period. An additional $220,000 has been spent in the same period for engineering consultants working on the design of new buildings and contributing engineering advice to the development division.

5 The expensive band oven is a money saver. Because of its high capacity, the plant and equipment charged to 100 lb. of production on a band oven is only $5.50, compared to $6.50 for the much cheaper reel oven. By 1953, National Biscuit expects to have 117 band ovens in operation despite the $125,000 average installation cost.

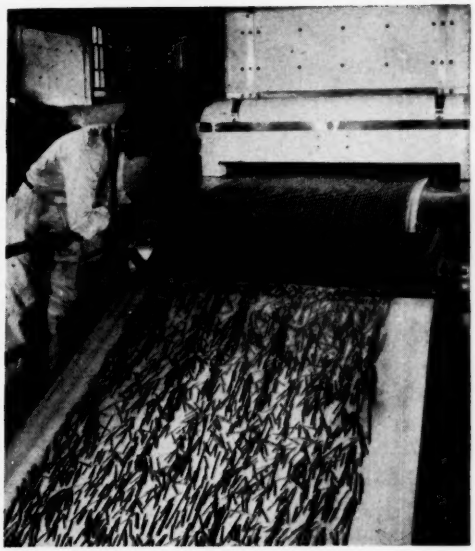
6 Packaging represents a bottleneck in many production lines. Faster, more flexible, and more trouble-free equipment needs to be developed.

7 Continuous mixers are needed to supplant high-cost batch methods. These would take materials handled by bulk methods and convert them—with the aid of automatic proportioning and instrument-controlled temperatures and speeds—into dough that feeds the continuous sheeters, cutters and ovens in a steady flow. Not only will these save money, but they will produce dough of a uniform high quality not

. . . and highly efficient continuous processes . . .



IN "MOST MODERN pretzel bakery," National Biscuit's New York plant, dough is extruded onto conveyor.



EXTRUDED and processed dough passes through band oven and breaks into sticks for automatic packaging.

always attainable where the human element is involved.

Already a continuous mixer is used to make marshmallow topping for cookies, at a rate of 1,200 lb. per hour. It reduces the cost, eases the plant sanitation job, and saves floor space. But more important, it delivers good quality marshmallow consistently. This mixer also can be used to whip cream and to mix icings, egg whites, and dough for sponge and pound cakes and coffee cakes.

8 Research means progress, and a lot of it is going on today in National Biscuit. To back up its belief in research, the company has built a large new laboratory equipped with the best facilities available. Among other innovations, the laboratory contains a "pilot" band oven—the first of its size and type to be made anywhere. Designed entirely by the company's engineering department, this oven will be of inestimable value in research work involving the solution of production problems on present and new varieties of crackers and cookies.

9 Workers have good ideas, too, and through a well-run suggestion program they can help to reduce costs and increase productivity. Good employee relations and pleasant working conditions also increase productivity.

10 Safety is no accident. And safety pays off handsomely in the factory and in the operation of truck fleets. The company's safety program is intensive, well planned, continuous.

. . . originate in engineering department

BETTER METHODS and equipment are developed in engineering department employing 360 people. Here is part of drafting section.

11 It pays to have a well-staffed engineering and development department which can design advanced machines, as well as plants, and build the machines if necessary. The engineering department in New York presently has 160 people working under the direction of Edward A. Otocka. Another 200 work in the Evanston, Ill., and Niagara Falls, N. Y., machine shops. Company policy is to buy a machine if what it needs is on the market. Otherwise, the firm develops and builds the new unit itself.

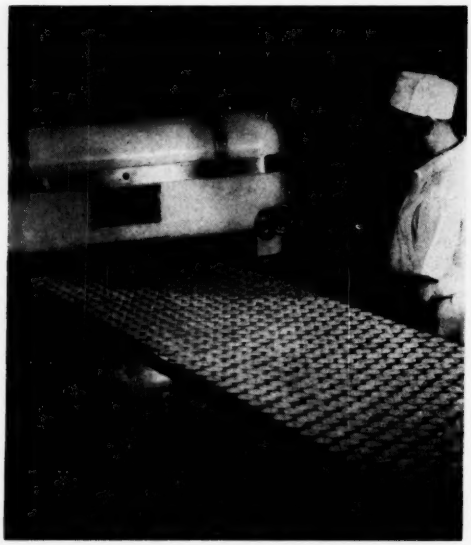
These are not idle policies. They already have resulted in very substantial achievements. And some of the more outstanding ones will be cited here.

Advances in Bulk Handling

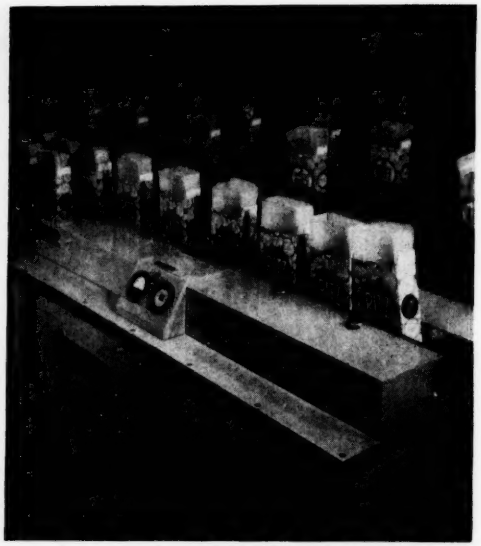
Progress in materials handling is exemplified by the bulk handling equipment installed in the efficient Atlanta cracker bakery. More than 6,000,000 lb. of flour a month goes into this plant. Airveyors convey it from the dumping stations to storage bins, and from storage to auxiliary bins feeding the mixers. And if desired, the flour can be conveyed in bulk directly to the latter bins.

Operation of this equipment is

Another Example of Advanced Methods



EFFICIENT Ritz cracker process—continuous from sheeter to packaging machines—includes band oven.



NO LABOR is involved in check-weighing Ritz packages. Automatic unit rejects those under-weight.

controlled from a single panel-board, lights indicating the flow to the respective bins. When a particular bin is either full or nearly empty, this is shown by indicating lights.

Efficient bulk handling practices may soon be extended to rail shipments of flour from the company's mills to its plants. Specially designed stainless steel and glass-lined cars are under test on flour, and may be adopted for carrying shortening and sugar. The reduction in cost through bulk handling is tremendous. Consider, for instance, the work involved in handling the 800 hundred-pound sacks of flour carried in a conventional freight car, and contrast this with the speed and ease of unloading a 120,000-lb. bulk car through pneumatic piping.

Processing efficiency in the Atlanta bakery is equally high. The straight-line operations involve 300-ft. band ovens and 200–240-ft. continuous cooling conveyors. After mixing, the dough travels without interruption through sheeters, cutters and ovens, the baked product continuing over the cooling conveyors to high-speed packaging lines.

All of the improvements of the Atlanta bakery, plus additional refinements, are included in the new cracker bakery in Houston, believed to be the finest in the Southwest. This is primarily a one-story bakery, with mezzanine floors where required and a second story over the main entrance for offices. Saw-tooth skylights and ample side windows make it a daylight bakery by day. Fluorescent lamps provide "daylight" at night.

The 1,150-ft.-long by 275-ft.-wide building has ample space for all operations and will also permit flexibility in the future. Sanitary maintenance is made easy by special washable tile walls and hard maple floors.

Materials are received at the rear of the plant, pass to huge automatic mixers, and then go through straight-line processing to the packing department. The length of each line, from the cutting machine to packing, is 600 ft.

Innovations in Portland Plant

A bakery of advanced design is also under construction at Portland, Ore. It will be the first of the new National Biscuit plants to employ the principle of oven installation on the second floor. With this arrangement, heat from baking operations will rise quickly through specially designed vents in the room. Result: Better working conditions for employees and higher productivity.

But the major feature is something new in raw materials warehousing. Surmounting the multi-story section of the building will be a large tower which will house bins for reception and storage of raw materials.

Another company achievement is the "most modern pretzel bakery in the world," located in New York City. Here batteries of extruders continuously turn out small-diameter "rods" of dough which are carried by conveyors through various processes to modern traveling band ovens. As the baked pretzel "rods" leave the ovens, they automatically break into sticks which are conveyed without interruption to automatic packaging machines. Twisted pretzels also will be made in this plant.

To be completed this year are new streamlined bread bakeries in Elmira and Plattsburg, N. Y., and modern cracker bakeries in East Liberty, Pa., and Toronto, Canada. The East Liberty plant will contain six traveling band ovens. A new soft cake plant for the company's bread department will go into operation soon at East Liberty.

No less than $16,800,000 was invested in land, buildings, equipment, and motor vehicles in 1948. And the investment this year is even higher—$20,000,000. This money comes out of earnings. It represents reinvestment in progress.

President George H. Coppers succinctly sums it all up:

"This long-range program will do much to increase our output, lower our costs and improve our service—with resulting benefits to employees, stockholders, retail food merchants, suppliers and the public. We are targeting all our plans and efforts at better products, priced to give the housewife good value and the retailer an attractive profit."

How Six Processors Reduce Costs

They report many and varied ways of cutting expenses, several of which can be effected by management without purchase of new equipment

JUST HOW MANY ways can food processors cut costs and increase productivity?

Every food plant operator has done some soul-searching on that question in the last two years. And a lot of answers have been found, many of which do not involve spectacular labor saving equipment. Several of these ways are revealed—together with savings through new equipment—in reports to FOOD INDUSTRIES from six representative food processing companies: Amalgamated Sugar, American Home Foods, Curtice Brothers, Glaser-Crandell, Seabrook Farms, and P. J. Ritter.

American Home Foods, Inc., New York City, gave early attention to tightening its inventory controls over raw materials and finished products. The result has been to place the company in a stronger position during the price decline, with reduction in its warehouse and storage space requirements.

But materials handling, according to R. A. Reinecke, vice-president for production, has offered the greatest opportunity for savings. The company has converted almost 100 percent to palletized operations since the war. And Dr. Reinecke looks to further reductions in this field with cooperation from the railroads in reducing transportation charges for pallets, both loaded and empty.

American Home has also developed standard costs for each department's operation, and it has improved accounting procedure to the point where cost-of-production figures are given to plant supervisors on the day following the actual production. In this way, any deviations become apparent immediately and steps can be taken to eliminate them before serious maladjustments develop.

High waste in packaging materials and a fairly high percentage of damage in shipments of products have also come in for a drubbing. The result here has been more rigid specifications for materials, elimination of oversized cartons to gain tighter packing, and tighter packed carloads. A great deal has been done in cooperation with the American Association of Railroads to improve shipping methods and reduce damages.

Labor saving equipment, however, has been bought wherever it was possible to anticipate sufficient labor reductions to offset the capital investment within a reasonable period. One such piece of equipment turned out better than expected. A foreman introduced a roller conveyor to speed up loading merchandise from pallet to truck. Then he found that by turning conveyors over so that rollers were on the bottom, the whole pallet could be easily rolled into the truck. This eliminated the use of one man.

R. A. REINECKE, American Home Foods, makes salient point on materials handling—one of highlights in this six-company symposium on practical cost-cutting procedures.

Savings by Freezer-Canner

Nine major cost cutting projects are listed by Seabrook Farms Co., Bridgeton, N. J., for its quick-frozen and canning operations:

1. The company has installed continuous-process asparagus sorting, prearranging, and packing lines (see special article on page 62).

2. High-speed automatic packaging lines have taken the place of certain hand-packing lines.

3. Buckets have been replaced by tub trucks in bulk handling of peas and lima beans.

4. Bulk tub trucks now feed lines from the floor above by gravity.

5. Root crops and spinach now are harvested by automatic harvester-loaders.

6. Pallet-fork lift trucks have been adopted for materials handling in some departments, and will be introduced into other departments in near future.

7. Incentive wage payment is used on all operations where practical.

8. Production standards have been drafted, based on time studies of all operations. Plant is striving to reach or better these production standards every day.

9. A supervisory training program has been installed. Weekly meetings put across improved methods of production.

Sugar Company's Moves

With an entirely different operation, Amalgamated Sugar Co., Ogden, Utah, has a particularly tough nut to crack. It has little control over either the costs of its raw material or the basic price of its finished product. Prices offered for the beet crops it processes must meet competition from government supports of other crops or the farmer will not grow the beets. And on the other hand, cane sugar producers are in a position to dictate the overall sugar price.

To meet the situation, the company has bent every effort to lower overhead while maintaining volume. Maintenance budgets were pared to prewar levels, and inter-campaign crews were reduced to the lowest levels since the prewar period. A careful study was made of the relative cost of using new parts in maintenance, as against repairing old parts by use of increased labor. The latter won out in this case, since it is desirable to maintain an experienced crew the year 'round, even though the operation is highly seasonal.

The company also reviewed inventories in detail. One representative each from purchasing, accounting and operating departments visited the various factories and surveyed, with superintendent, master mechanic and storekeeper, current inventories of operating supplies and maintenance materials. A redistribution of some items between factories was found effective. It was disclosed that many

items were not being used because improved units were available. Whenever practical, the less durable items are now being employed and no new ones will be ordered until the old are exhausted.

Whenever possible, high priced items will be used before new items are purchased, to anticipate still further drops in price. The company is confident that a continuing study of inventory offers a promising means of future cost reductions.

But Amalgamated made some bigger changes, too. Three of the five factories are now equipped with continuous diffusers (see page 112, May FI) in place of the old batteries. Crews have been reduced from 21 to 3 men in some cases along with a reduction in coal consumption and sugar losses. And the new diffusers have increased daily capacity as much as 33 percent.

Committee Effects Cuts

The P. J. Ritter Co., of Bridgeton, N. J., set up a three-man committee on cost reduction and accented two yardsticks: Will It Reduce Costs? Will It Increase Sales? There was one further qualification: "In 1949?"

The committee was formed by the comptroller and the vice-presidents in charge of research and engineering, and of production. This committee held conferences with each department head and recommendations were ironed out. Adoption of this group's report has resulted in "substantial savings."

One of the most effective of the recommendations followed has been the elimination of many non-working foremen and supervisors. These men, representing a great deal of experience, have been put to active work, replacing a corresponding number of hourly employees. Certain jobs in all departments were eliminated, but no salaries were cut. Certain activities, quite necessary in war years and desirable in peacetime, were dropped as being "a little too fancy for our spot in the industry in times like these."

Closer Control Does It

Glaser-Crandell Co., Chicago, estimates savings of "very close to 8 percent" due almost entirely to closer control all the way down the line. Company salesmen are making more calls per day, they are carrying more samples, and they are calling on "less important" buyers. Purchasing agents are checking the markets more thoroughly before awarding orders, and "they are a little more audacious in making counter offers." Moreover, the company is "probably accepting business of the overhead absorbing type at a slightly closer margin."

All this has affected personnel throughout the plant, and more productive work is being done "per hour, per day and per week."

Importance of Personnel

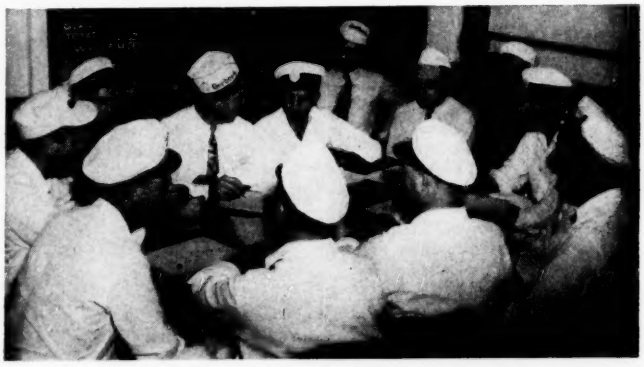
Increased palletizing in materials handling was also one of the key points in the program of Curtice Brothers Co., Rochester, N. Y. In addition, this company is employing strictly modern equipment on its limited farm operations and is placing considerable emphasis on budgetary control.

But President H. T. Cumming regards the company's investment in management personnel as its most important control activity. Plant managers of the future, in Mr. Cummings opinion, will have to have more formal training, due to the industry's increased emphasis on quality control, sanitation, and on greater mechanization of plants.

However, the young man with a formal training must devote several years at a pretty low level to get the kind of practical experience needed to supplement the learning he has secured formally.

On capital investments, the company tries to measure everything in terms of how quickly it will pay back in labor saving and other efficiencies.

Granted, each organization is different—and each problem encountered is different. But the experiences of these six representative companies demonstrate that when higher productivity and lower costs are sought, the working principles remain the same—and they can be depended upon for tangible dividends.



IN DAILY MEETINGS, foremen aired their ideas and comments. Success of company's cost control program was sparked by their cooperation.

Foremen Key To Gerber Cost-Control Program

How cost-and-methods man obtains their confidence, trains them, and lets them carry the ball in putting cost-reduction plans to work

SUCCESSFUL cost control, according to Gerber Products Co.'s plan, is keyed with specific education and training of foremen and other supervisory personnel.

Basis of the company's effective program is to have a large group of people pulling together to increase efficiency and reduce cost. This is more effective than having one person or department trying to shoulder the load.

About four years ago, a cost and methods man, John Suerth, joined the company. He spent his entire first year with the foremen in the plant.

His objectives were twofold. First, he wanted to put across to these men the value of cost-consciousness—to show them where economies could be effected and where false economies would be dangerous. Secondly, he wanted to educate himself in plant problems and become fully acquainted with the attitudes and viewpoints of the foremen.

In addition to working with the foremen individually, Mr. Suerth brought them together for a daily 20-min. meeting. Here he presented pertinent information on blackboards in easy-to-assimilate graphic and tabulated style. He invited open and free discussion of any problems facing the foremen.

In the beginning, the response at these gatherings was meager and frigid. This situation was considered a normal reaction by the methods engineer and did not discourage him a bit. He felt that he had something to sell, and he had utter confidence in it.

The meetings continued daily. The personal contacts continued daily. Slowly, and in small degrees, a gradual melting around the edges of the group was noticeable. The foremen did have ideas. They did have gripes. They certainly did have things on their minds. And they wanted to air them.

Cooperation of Foremen Obtained

At last they began to show confidence not only in the methods engineer, but also in other members of their own group. By the end of the first year, all skepticism had vanished and each meeting brought forth a multitude of problems, ideas and plans. The men overcame their self-consciousness and openly and intelligently discussed their questions. The discussions gave each foreman a chance to become familiar with other department problems. Every man got an insight into what he could do to help his fellow worker.

This first year period was likened to a two-way educational system. While the foremen were learning methods of increasing efficiency and cutting costs, the methods engineer was learning many things from the foremen. Primarily, he learned their attitudes and their individual characteristics. He, too, was getting concrete problems into which to dig his teeth.

From this experience it has been concluded the plant foremen group is the ideal place to incorporate cost control, and that these men can do an excellent job when given the proper information and the responsibility for showing results.

Cost System Improved

The plant's entire cost system was overhauled as a result of the first year's education and training efforts. All foremen were given manuals describing job numbers. Accounts to be used in compiling costs by department and product were issued weekly. An indirect cost report by departments was issued monthly.

Recently, the company started issuing daily cost reports. The cost and methods department analyzes these reports for the foremen and passes along the information.

Foremen have become sensibly cost conscious and carry the ball on most cost-reduction programs. They even call on the methods department for long-term programs and special assignments.

Gerber's definitely feels that the success of the cost-reduction plan rests almost entirely on securing the cooperation of the foremen.

How Straight Thinking Saves Time, Money

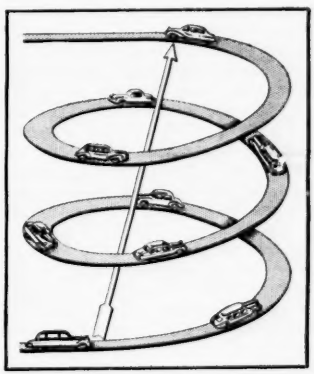
Is shortest distance between problem and solution. Clear analysis and complete specifications often reveal best answer without cut-and-try steps

HORACE L. SMITH, Jr.
Consulting Engineer, Richmond, Va.

Opportunities for reducing costs by utilizing research and development are so great that even poorly directed research can pay worth-while dividends. It is possible, however, to increase the efficiency of research by straight-line thinking, which is the shortest distance between the beginning and end points of a problem.

The starting point consists of all the information available on the subject to date, and the end point is the desired increase in efficiency or the improvement in product. In going from the starting to the end point, the usual route followed in industry is somewhat like this:

The inventor or designer has a new idea for a machine. The idea looks practical, providing the engineering problems can be worked out successfully. The first step is to make a crude model, usually to prove some of the basic principles. Then a full-size working machine is designed and built. But after a few preliminary tests, it is immediately apparent that a number of changes should be made, either to simplify the design or to improve the functional operation of the machine. So a second design is made and another machine is constructed and tested. There may be six or eight redesigns, until finally the machine satisfies the requirements of performance and economical manufacture. And the final machine usually is a far-cry from the first crude model.



STRAIGHT-LINE thinking gives ramp problem happy twist. This simple application clearly demonstrates technic. Another example shows how it works for complex food-engineering problem.

Even though this may be the accepted procedure, it is not necessarily the best method. All of the intermediate steps between conception of the idea and the finally approved design are caused by inability to analyze the problem clearly.

Simple Example of the Technic

Here is an example of applied straight-line thinking which illustrates the basic principles involved, although far removed from food processing. It is the case of the 10-floor down-town parking garage.

With multi-floor garages, the first

elementary problem is how to get the cars up to the several parking floors and back down to the street level. There are two ways to do this:

a. Elevators or some form of mechanical lifting device.
b. Some form of ramp or inclined plane whereby the cars can proceed under their own power.

Assuming that the decision is to use ramps, the next step in our straight-line thinking is to select a limiting grade, or inclination, of the driving surface. The most efficient ramp would be a long straight one of 9 percent grade, because the car would be climbing a continuous, uniform slope and require no manipulation of the steering wheel or other effort on the part of the operator. However, a straight ramp would have to be more than 1,000 ft. long to reach the tenth floor, so it could not be used. But instead of discarding the idea of a simple ramp, suppose the ramp be spiraled?

The diameter of such a spiral will have to be gaged so the largest cars can follow its curves. This will require an outside diameter of approximately 64 ft. Five complete circles will reach the tenth floor. This means that for each complete circle, two floors in height are gained. Therefore, at each half circle a connection is made with an adjacent floor.

This spiral ramp answers the specification of a continuous uniform grade and provides the same driving ease as a straight ramp. Once the steering wheel is set for the correct turning radius, it does not have to be moved until the desired floor is reached. And by using second gear, a car can descend such a ramp without need for employing brakes.

Taking It a Step Further

So this single spiral ramp satisfies conditions for driving either up or down. But it is not practical to make the ramp wide enough to accommodate up and down traffic simultaneously. To overcome this difficulty, it is only necessary to take another identical ramp and intertwine it with the first. Here we have, in effect, a huge double thread screw. Up traffic uses one thread, down traffic the other. Each of the two ramps connects with each floor, so quick and easy access and egress is secured. The two spirals or threads take up no more usable floor space than one would require. The core space in the center of the spiral accommodates six cars on each of the floors.

This example shows how straight-line thinking and a clear analysis of the problem can be applied to reduce an abstract need to a practical and workable end result. Actually, the double spiral ramp system has been most successful in practice.

Here is another example—one involving food and chemical engineering. In drying heat-sensitive materials, drying from the frozen state provides a very acceptable solution to the problem of protecting quality. The advantages of this method of drying have been appreciated for years, yet the method has not been used to any great extent in the food industry. The reason is that the cost of operation has been much higher than for competitive methods of drying.

Methods Previously Tried

The major element of cost in operating a freeze-drying plant is the continuous removal of tremendous volumes of water vapor from an almost perfect vacuum. Several ways of handling this problem have been tried, the more common being:

1. The use of some drying agent, such as silica gel or other hygroscopic material, that has a high affinity for water vapor. These materials usually absorb only from 5 to 6 percent of their own weight in water-vapor, and then have to be removed and regenerated.

2. The use of refrigerated surfaces, usually in the form of extended-fin coils, so that the water vapor freezes on the surface of the coils. Ice being a poor conductor of heat, the rate of heat conduction decreases rapidly.

3. The use of multi-stage steam jets to remove the water-vapor as a gas. Steam jets are reasonably efficient down to pressures of 5 or 6 mm., but as the vacuum is increased beyond this point, the efficiency of steam jets decreases very rapidly.

With conditions of the problem as set forth above, what should be the mental processes in analyzing this situation and applying the theory of straight-line thinking?

Applying Straight Thinking

As a starting point, first consider the substance itself, which is water. Water in both the liquid and solid state occupies a relatively small volume per pound, approximately 30 cu. in. When this substance is changed into a gas, the volume varies inversely as the absolute pressure. At 1 mm. absolute pressure, 1 lb. of water vapor occupies approximately 20,000 cu. ft. If this substance could be removed as a liquid instead of a gas, it would be necessary to remove only 30 cu. in. Therefore, it would appear logical to investigate ways to remove the water vapor as a liquid and not as a gas.

The first step would be to consider means of condensing the water vapor in the vacuum chamber. To secure condensation and at the same time maintain a liquid condition, it will be necessary to find a material that has the following characteristics:

a. The material must be miscible with water, and in addition should have a high affinity for water.

b. The material must have a very low vapor pressure so that it will not vaporize or boil at the existing vacuum.

c. The material should remain fluid at low temperatures. To condense water vapor the material would have to be at a lower temperature than the water vapor.

d. The material should not be toxic, because it is to be used in the proximity of food products.

e. The material should be capable of regeneration. That is, it should be possible to boil off the water condensed and absorbed by the material without any change or break-down in the material being used.

An examination of the physical properties of different materials indicates that at least one will fill these specifications. This is lithium chloride (LiCl).

Answer Is Practical, Simple

If a water solution of lithium chloride of approximately 30 percent strength is refrigerated, and this refrigerated brine is sprayed into the vacuum chamber, water vapor surrounding the spray will be condensed immediately by the cold spray. Then the lithium chloride solution can be pumped from the chamber, passed through a cooler, and continuously reused. Constant strength brine can be maintained by diverting a small percentage of the solution to regenerate or boil off the water.

The above is a very practical and simple solution to an industrial problem that has been quite difficult to solve. The important feature in the analysis of this problem was the clear understanding of the specification. In other words, although the use of a lithium chloride solution proved to be the answer, no attempt was made to look for lithium chloride or any other material until after the problem had been clearly analyzed and a complete specification written as to what was required.

And It's Cheaper

When such straight-line thinking is applied to a problem, the answer often becomes apparent. And it usually is a new and unusual method of accomplishing the result, one which is entitled to a patent. And the achievement is quicker and less costly than by the cut-and-try route.

How much time? How many workers? Bars give answers

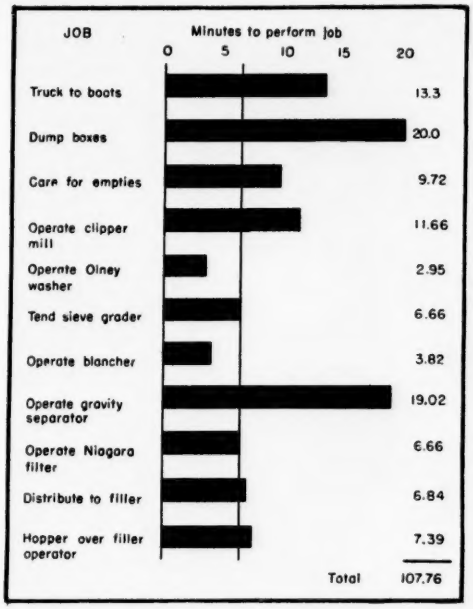


CHART I. Here, time required for the normally competent operator to complete each task in the whole job is charted.

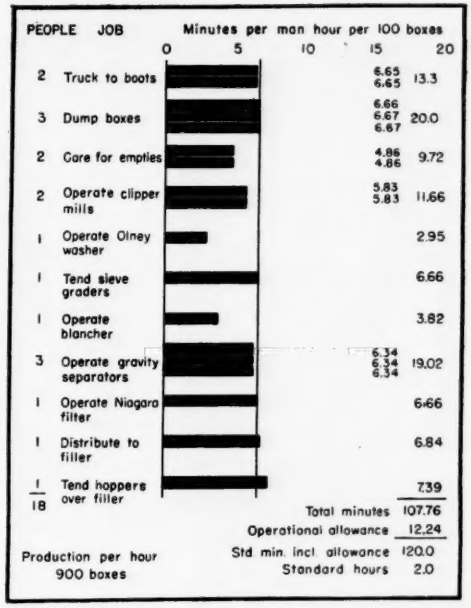

PEOPLE JOB
Minutes per man hour per 100 boxes
0 5 10 15 20
2 Truck to boots 6.65 6.65 13.3
3 Dump boxes 6.66 6.67 6.67 20.0
2 Care for empties 4.86 4.86 9.72
2 Operate clipper mills 5.83 5.83 11.66
1 Operate Olney washer 2.95
1 Tend sieve graders 6.66
1 Operate blancher 3.82
3 Operate gravity separators 6.34 6.34 6.34 19.02
1 Operate Niagara filter 6.66
1 Distribute to filler 6.84
1/18 Tend hoppers over filler 7.39
Total minutes 107.76
Operational allowance 12.24
Std min. incl. allowance 120.0
Production per hour 900 boxes
Standard hours 2.0

CHART II. To meet a set production schedule, work is then distributed among the required number of operators.

Balance the Work and You Lower the Bill

Labor savings ranging from 40 to 80 percent have been achieved in cannery tasks through uniform distribution of the work load among employees

BY analyzing the jobs in its various departments and then equalizing the work load among the employees, the Minnesota Valley Canning Co., Le Sueur, Minn., has obtained surprising labor savings on the different tasks. These savings range from 80 percent on the job of emptying hopper trucks into elevator buckets, to 40 percent on the handling of empty cans.

Allotting work equitably among employees is extremely important in any endeavor—and particularly in line operations. Nothing is more irritatingly costly than having several men standing idle waiting for one man to finish his job so that the others may proceed with their own.

How best to balance a work load is therefore a prime problem. It has been solved satisfactorily at Minnesota Valley with a method involving the application of standard time data.

Each operation is first timed by means of a stop watch. This time is then corrected to that required by a normally competent operator (the normal is figured on the performance of the average employee). A rest allowance in proportion to the resultant fatigue is then added.

Chart I illustrates the method as applied to one department of a company plant. Tabulated on the left are the specific jobs. And on the right may be seen the number of minutes required to perform each task for every 100 boxes dumped, as determined by the time study.

If one man did all of the jobs in succession—for example, first, trucked 100 boxes to the dump; second, dumped the 100 boxes; third, cared for the empties; and so on—it would require a total of 107.76 minutes of his time. Expressed in a yardstick unit of time, he could dump and prepare the contents of $55\frac{3}{4}$ boxes in 1 hr.

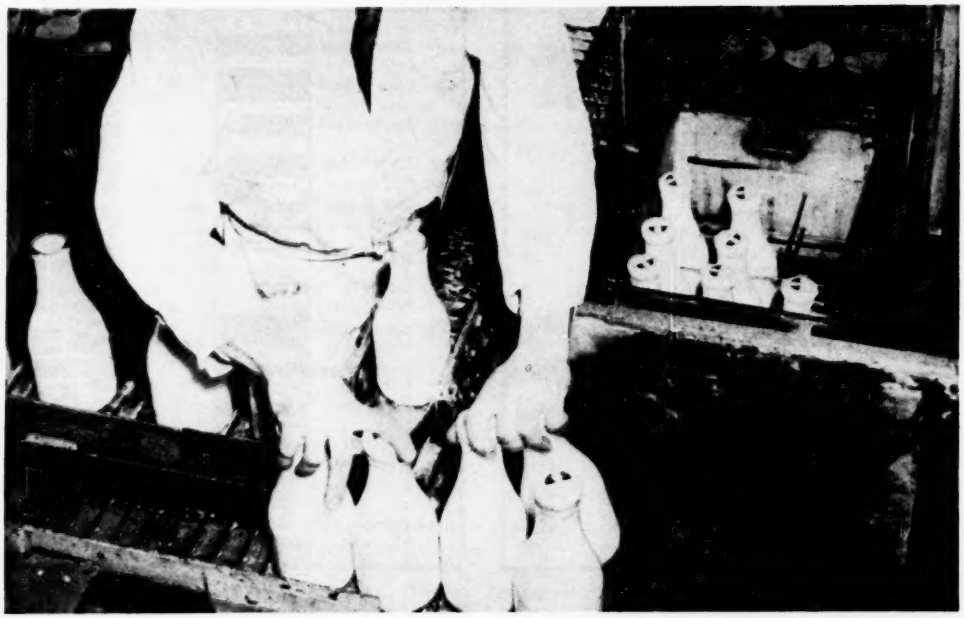
If two men worked together on the job, they could dump and prepare $111\frac{1}{2}$ boxes or twice the number.

Consequently, the problem becomes one of balancing the work among several employees so that sufficient boxes are dumped and prepared each hour to take care of the plant's requirements.

If the plant operates best at 900 boxes per hour, the number of workers required is determined by dividing the number of boxes required (900) by the number of boxes one man can dump and prepare ($55\frac{3}{4}$), which is 16.15 persons.

Obviously, workers cannot be subdivided. But they can be so stationed on the work as to approach this ideal. Distribution of this work among the employees is shown in Chart II. The number of employees for each task, time per employee, and totals for both, are clearly detailed.

Work Simplification Pays Off



LIKE THIS

↑ **BEFORE** simplification, operator had awkward job of "bridging" flow of bottles from capper to sealer—and then had to do difficult pivot to put bottles in case (right).

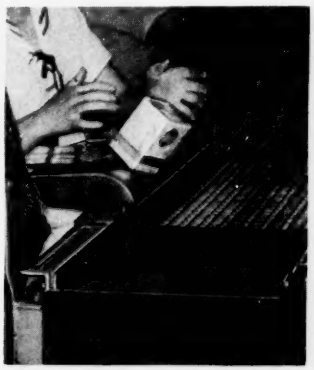
AFTER the improvers got busy, there was no more "bridging", because capped bottles now cross conveyor at left of operator. Result: Direct "dropdown" casing, less fatigue. ↓

Program boosts employee morale, increases production, and cuts costs for large New England dairy. Methods used are applicable to all food processing plants

AND THIS

LOST TIME was bane of former ice cream packaging setup, because operators had to place closed cartons on inconveniently located conveyor.

SAVED TIME and upped output resulted from relocating filler spout so that it is now directly above conveyor leading into hardening tunnel, thus streamlining operator's task. Production rose 29 percent. (See closeups below.)



NOW, mere removal of hands drops package off specially-curved baffle onto belt.

HAROLD G. DUNLAP

Work Simplification Director, H. P. Hood & Sons, Boston, Mass.

Very definitely, work simplification has "paid off" at H. P. Hood & Sons, Boston.

It has increased production and reduced costs by improving the methods and eliminating the unnecessary motions. What's more, it has boosted employee morale by making jobs easier.

The accompanying photographs illustrate a few of the many operational changes resulting from work simplification in our plants.

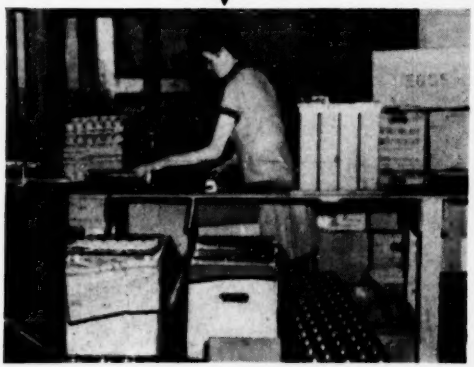
And just how was this progress brought about? Well, the story dates back to 1941, when we first tried the idea of taking a movie of a job that we had been unsuccessful in reproducing in another plant. Admittedly, this initial attempt at the camera-eye approach didn't automatically supply all the answers. But it did teach us the value of movies in industry. It also showed us what could be accomplished by bringing the employees concerned into the discussions and analyses of their jobs.

Our project has come a long way in these eight years—from the part-time services of a branch plant superintendent—to a full-fledged staff department. To date, 493 supervisors from all divisions of the company have been given a 20 hr. basic training course.

A work simplification development group, consisting of 16 individuals

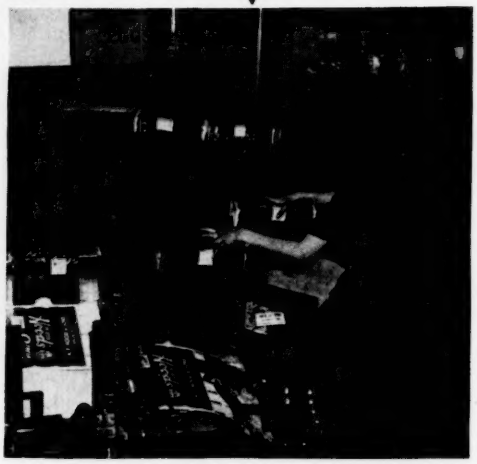
For more "Old vs. New" photos, turn page →

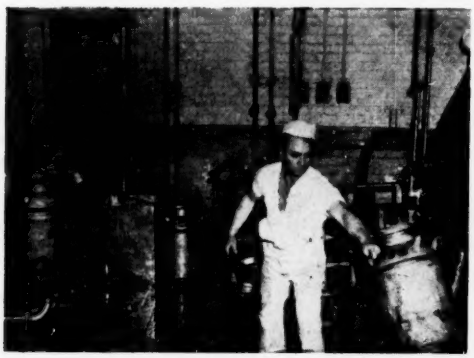
OLD . . . . . gives way to . . . . . NEW



With straight-away conveyor, one operator was required to pack cartons of eggs from each candling line.

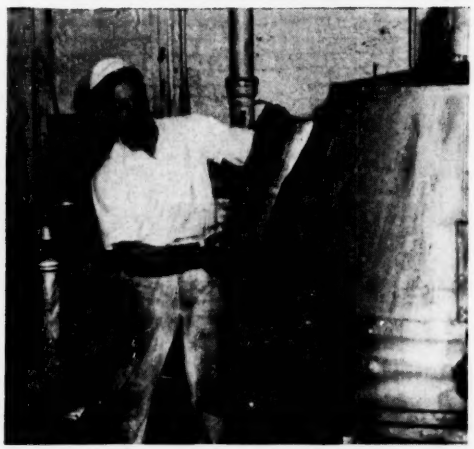
NOW, aided by rotary table and improved conveyors, → one operator handles output of two candling lines.

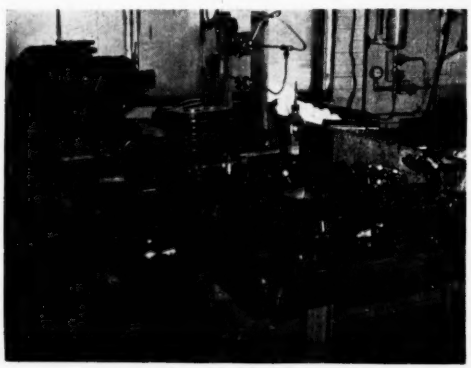




Operator walked 2 miles daily in washing empty milk and cream cans in receiving room of ice cream plant.

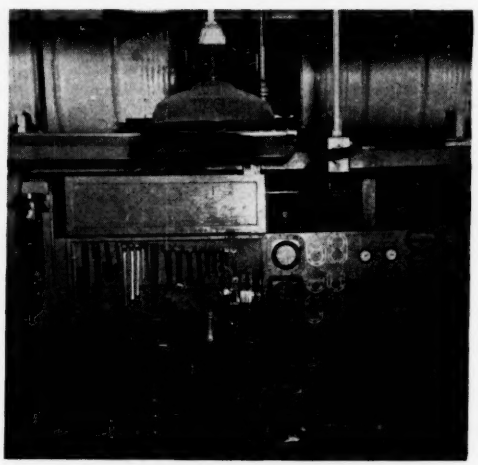
NOW walking is eliminated. Can washer was relocated → and discharge conveyor installed. Saved: 2 hr. daily.





Confusion and disorder resulted from arrangement of this repair bench in ice cream cabinet division.

NOW orderly placement of tools and pre-positioning of → repair parts speeds operations.



Raised billing machines, and files on revolving cabinets, slowed down and tired operators at order desk.

NOW billing machines are depressed to table level, files→ revolve. Operation is 25 percent more effective.

In casing pints of milk, excessive reaching and twisting were required because of accumulating table.

NOW direct take-off eliminates twisting, reduces reach- → ing. Change made overflow table unnecessary.

from different departments of the company, meets at the Boston headquarters one full day each month. The men discuss problems and trade ideas, keep informed on the latest technics of work simplification.

As the result, the program has been applied to a large number of operations in different departments of the company.

The Plan In Action

And how do we proceed? First, a specific job is selected—one causing a bottleneck, or a waste of materials, time or energy. The next step is to ask the question, "Why do we do the job at all?" or "Can it be eliminated?" If we feel the job cannot be eliminated, we use one of our many tools, the Flow Process Chart. In using this tool, we are able to break down the job and form a graphic picture of the operation, listing in sequence each detail, no matter how short or temporary, so that the questioning approach may be applied to each phase.

Jobs can usually be divided into three parts—"Make Ready," "Do," and "Put Away." "Do" operations are designated on the chart and are first to receive the questioning approach. Then, and only then, do we consider the "Make-Ready" and "Put-Away", which we find generally add little, or no value to the product. It is in these last two operations that we many times find outstanding opportunities for improvement.

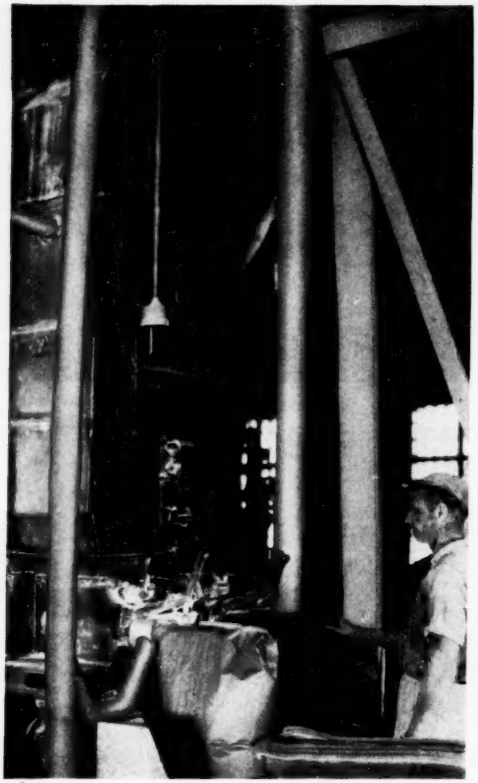
After the unnecessary parts of the jobs have been eliminated, we review the remainder with an eye to combining, changing sequence, and finally, simplifying all elements. When these steps are completed, what finally remains is the proposed method. It is then discussed with all employees involved in the operation, and at last the proposed method is carefully outlined on a standard operating procedure chart.

Putting these new methods into action is not difficult when the supervisors and employees doing the job have personally participated in the developing of this new way. They are rightly proud of their ideas. They think and believe that the improvement is good, and are, therefore, determined to make it work.

The program has particularly paid dividends in improved employee morale —especially noticeable by the interest displayed by operators when a problem is being worked on. And a major goal has been won in increased productivity.

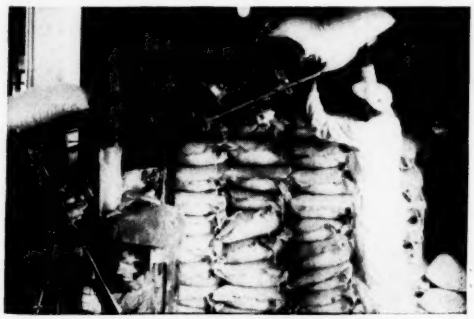
Full practical details on how Hood's Work Simplification Program operates will be given in an article to appear in a subsequent issue of FOOD INDUSTRIES.

Five Installations That Mean Thousands of $$$ in Thrift



AUTOMATIC starch-bag filler replaces four men, and is figured to save $12,000 annually. It cost $20,000.

NEW filling and capping equipment in table syrup line cost $16,000, but saved that amount in one year.



THIS LOADER automatically carries bags from production into freight cars. Now two men do work of five.

We *Modernized* to Solid Savings

Advanced equipment was the answer when this leading wet-corn processor gave a new sharp accent to low-cost, high-quality output. And now the dividends roll in

LOUIS E. DOXSIE

Supervisor of Manufacturing Supplies,
A. E. Staley Manufacturing Co., Decatur, Ill.

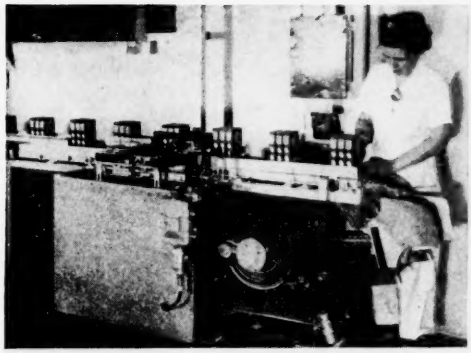
During the long war years, there was a very big demand for our company's various products. Emphasis was on high production. Quality and unit cost took a back seat while we rushed products through the plants, making more and more to meet seemingly insatiable demand.

Production goals never thought possible were achieved. But, now that the rush is over we can sit back in retrospect and realize that our technics suffered in that big production push.

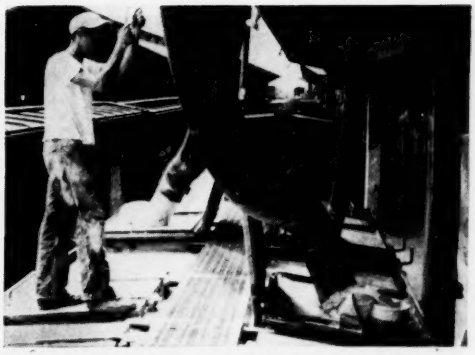
This condition was not the result of being uninterested in improvements but more a case of just not being able to obtain the modernizing equipment needed or the manpower to plan, test and install it. Delivery of machinery was uncertain—in some cases 5 to 20 months—and economic conditions were too unstable to predict whether the changes would be justified at time of delivery. Moreover, the improvements did not mean too much because the savings involved might not justify the expense after taxes had taken their cut.

Now, however, competitive selling is here again. Our salesmen are seldom entertained by their customers. It takes hard work to sell the merchandise, and we in the plant must work hard to cut costs to meet the terms of our competitors. At A. E. Staley Mfg. Co., we have, therefore, changed our emphasis from production at any cost and now put the accent on more carefully controlled production of high quality products made at a competitive price. Customer satisfaction is our keynote.

In order to maintain our competi-



COMPANY-DEVISED unit for premium deals. It can tape vari-size packages together, holds costs to a minimum.



BULK LOADING into cars by air conveyor through flexible spouts is effective saving—about $250 per car.

tive position in the industry, we have made numerous alterations in manufacturing processes. We have begun the task of completely modernizing our whole plant. Seeking economies, we have made three general types of improvements—changes in our production methods, in our system of handling materials, and in shipping.

Production Improvement

As for the production-method changes, these were for the purpose of obtaining higher quality while reducing time and labor application. In practically every instance, gratifying results were obtained.

Two of the five lines in our table syrup operations have been modernized by adding new filling and capping equipment. Expenditures here, amounting to $16,000, were returned to us in savings the first year.

New automatic labeling and filling equipment allowed us to double production on liquid starch. By this means, we eliminated an entire shift. For an expenditure of $15,000 we are now saving $24,000 annually.

For bagging starch, a new type packer was installed. This addition required 18 months experimental work and cost about $20,000. However, one man now does the work which formerly required five. Besides, this installation offers a potential savings of $12,000 annually and promises a better product.

Because this machinery has proved so successful, another unit of the same type is being installed in the starch-bagging building. Similar installations were made for soy products.

It has been difficult to adapt the new methods to some products, but in each case where they are used it has been possible to carry on the operation with one or two fewer persons on each shift.

When the changes now underway in the corn feed packing are put into effect, it is estimated that several thousand dollars will be saved each year. Feed is normally packed in oversize bags because the ordinary equipment fills them unevenly. A new bag, 4 percent smaller, and new bagging equipment which saves labor and properly fills the bags, will bring about the savings.

Quality of the packaged starch was increased greatly when new installations in this department made it possible to eliminate night shifts almost entirely. Here again, solid cash savings were achieved.

The Maintenance Angles

With the adoption of these high-speed and automatic machines, we were faced with a maintenance problem. This was met by setting up in our mechanical shops specialized groups trained in the maintenance of the new machines. Result is fewer breakdowns, shorter delays, and increased efficiency, with maintenance costs reduced. Often, replacement parts can be made in our own shops more economically than they can be purchased.

With the new merchandising methods we now use, the sales department requires special premium deals from time to time. Many of these involve the addition of the premium to the package itself, and some require that two or more containers of different products in various sizes be placed together. For this work, we have developed an automatic machine for taping cartons and bottles together for shelf appeal. Use of this equipment allows production of special deals at a minimum of extra packaging cost. In recent months, premiums such as dish cloths, spoons, knives, and the like, have been taped to cartons with the use of this machinery.

In changing the methods of handling materials, we kept in mind that "material best handled is least handled." Handling does not add to value. It increases costs.

Conveyors and power trucks seem to be our best solution here. At a cost of $10,000, we set up a package starch conveyor system which not only saves $4,000 a year, but has also reduced damage in warehousing. This system takes starch packages from the production line to storage. The only manual handling is at the storage pile.

A new conveyor system now carries bags of starch directly from production to freight cars. A portable loader within the car aids further by carrying the bags from the doorway to the ends of the car. The whole process requires two men—against the old five or six.

Power trucks have been put into effective use in the syrup, soy flour, and yard departments. This trucking is replacing almost all manual handling of materials in those departments. We find, by using the power trucks, that there is considerably less damage and considerably more storage space. Incoming supplies are palletized, making for more orderly storage and simplifying inventory problems.

From 6 Men to 1

Unloading and storing bales of bags—formerly a job to which six men were assigned—is now done by one man and a power truck. Where possible, we use unit loading of the finished products, but this method is still not economically developed for application to all our products.

Bulk loading is also an effective means of saving on costs. Where it is practicable for a customer to receive this type of shipment, there is a saving on both bagging and loading costs. When such a method is followed, the product to be loaded is generally blown into the car by air conveyor through flexible spouts. It is estimated that up to $250 savings per car can be realized when bag loading costs are eliminated.

BY GENTLE UNLOADING of cases of empties onto unscrambling table, severe scratching and bruising of your glass jars can be considerably reduced. While actual breakage does not usually occur at this point, fracture analyses of jars subsequently broken trace the troubles back to impacts at the dumping table.

How To Cut Glass-Breakage Costs

Simple protective program not only guards your containers but it also brings additional notable savings all along the line

TO many food processors, the principal criterion of all glass containers is their performance on the packaging line and during distribution. But while the advantages of glass as a packaging medium are widely appreciated, there is a general lack of knowledge regarding the physical characteristics of glass as related to potential and actual breakage.

Glass manufacturers accept the responsibility of delivering glass containers that comply with standard dimensional specifications and that are free from material defects contributing to breakage, faulty performance, or poor appearance. However, they have no control over the subsequent use of their product.

It is felt, therefore, that users of glass containers could improve their operational balance sheet with better quality ware, provided they know something about the nature of glass-container fracture. As diagnosis leads to the prescription that may cure the patient's ills, so may knowledge of glass fractures permit a diagnosis of their cause, and hence, lead to corrective measures.

Causes of Breakage Outlined

Here then, are some primary aspects of glass fractures:

1. In practically all cases, the fractures originate at a surface. For example, in the case of a bottle, fractures may occur either at the inside or outside surface. The pattern of the fracture is a perfect clue to the cause.

2. Glass breaks under tension or a "pulling apart" stress. It never breaks under compression, unless secondary tensile stresses are produced.

3. A glass container can be subjected to tensile stresses in a number of ways, the most common being: (a) Internal pressure (tensile stress external). (b) Thermal shock, either temperature rise or temperature drop (tension is produced in both cases on the coldest surface). Thermal differential limits from cold to hot should not exceed 140 deg. F.; from hot to cold the limit should be 80 deg. F. (c) Impact or bumping (tension is on the side opposite that struck). This is why a professional glass cutter first scratches the glass on one side and then taps the glass on the opposite side of the scratch. (d) Torque or twist (maximum tension is produced at the minimum diameter of jar, in circumferential plane near top, when closure is applied too tight).

4. Glass containers free of manufacturing defects—and as delivered to the trade—have high tensile strength. Average tensile strength of such glass may run about 3,000 psi.

Unwittingly, the user of good glass containers frequently reduces the original strength of the ware as much as 90 percent by subjecting it to severe and unwarranted service conditions. Main cause of reduced strength of bottles is scratching—by sharp guide rails, exposed screw heads, worn and roughened indexing turrets, defective conveyor chain, worn bottle rests on semi-automatic or hand-operated equipment, and sharp separating triggers.

Accumulative bumping in long lines

or individual impacting at handling stations comprise other serious problems that could readily be corrected but usually go unrecognized. Perhaps one reason for this is the idea that breakage is a necessary evil. And unless breakage reaches the alarming proportions of 1 or 2 percent, the problem receives no attention. A cost reduction program can well afford to consider so-called incipient breakage losses in the region below 1 percent.

Case of the Mayonnaise Packer

For illustration, let us consider two specific cases—call them Case Histories A and B. A mayonnaise and salad dressing packer is our subject in Case A. His operation involved a line turning out 108 jars a minute and a study of this line over a period of time indicated that an average of 11 jars were broken on each 8-hr. shift—1 jar every 44 min. Down-time on each shift chargeable to broken jars and to clean-up averaged 78 min. per shift.

In terms of potential production, this meant a reduction in the day's output of 8,424 jars. And in terms of labor it was estimated that 23 man-hours were lost to production in all departments. At an average of $1.03 per hour, this came to $23.39.

Actually, this breakage amounted to only slightly more than 0.02 percent. Yet, as the brief figures given above will show, the dollar value involved over a period of time was substantial.

Analysis of the breakage by a competent glass technologist and food engineer brought remedies which reduced breakage to an average of 1 jar every 9 hr. 53 min. In this case, the packer willingly cooperated with the glass manufacturer's representatives, and he kept an open mind on all the fine points posed about glass handling and packaging.

Case of the Preserve Packer

Now to Case B, which is concerned with a preserve packer: His single production line had a capacity of 42 jars a minute. Six employees understaffed the plant to the extent that details were overlooked. Breakage was extremely erratic, but when averaged over an 8-hr. shift, the figure was 53 units. And total production could only account for a 40-min. hour. Figures in terms of dollars and cents, with which to evaluate the real and intangible losses, are not available. But it is obvious that a significant dollar value is involved.

As in Case A, the glass manufacturer was finally asked to make a study of the operation. And the suggestions put into effect reduced breakage to a negligible point.

On many days, this plant now operates without any breakage. The maximum reported over a considerable period has been four broken units (on 8 hr. shift). Production has been increased to a 52-min. hour. While breakage in this case amounted to less than 0.4 percent prior to the time corrective measures were taken, the fact remains that this operation was subject to considerable improvement by the savings in time, materials and production capacity.

Let us look into some of the causes of breakage in these two cases and learn how they were corrected.

In Case A, there were three factors responsible for breakage. First, jars were dumped out of cases onto a hard-surface horizontal plate at the start of the production line. What's more, employees appeared a bit too forceful in doing this unloading job. As a result, the heels and bases of jars were severely scratched and bruised. Probably 50 percent of the container strength was lost in the damaged area. Actual breakage did not occur at this point. But fracture analysis of jars subsequently broken indicated the trouble originated at the dumping table.

Corrective measures were taken. The dumping table was redesigned to tilt toward the worker at a 45 deg. angle to horizontal. And the hard surface was replaced with a plywood-backed thin sheet of stainless steel to provide cushioning. Now the operator places the open face of the case containing jars against the tilted plate. Because of direction of motion, it is difficult for him to use damaging force. Having positioned the case, the operator tilts the table to a horizontal plane, slides the case forward to the unscrambling belt, and lifts off the case.

These simple corrective measures proved effective—damage to containers was eliminated.

Second, line pressure caused by starting speed was excessive in relation to that created by discharge speed. As a result, the jars would rotate and grind against one another throughout the line. Damage was slight when the pressure was low. However, with high line pressure, severe scratching occurred at critical panel locations on the jar. Such scratches became the foci of fractures sustained in subsequent impacting.

Corrective measure taken was to reduce the speed of the line at the start by slowing up the rate of discharge of the unscrambler. Also, the speeds of the filler, capper and labeler were synchronized as close as possible. And an automatic control switch was installed to shut down the entire line in event of a breakdown of one unit. Line pressure and impacting were reduced and consequently, breakage.

Third, there were minor causes of breakage, such as rough and worn indexing star wheels on filler, capper, and labeler; an incorrect torque tightening force applied to caps at labeler; protruding screw heads holding guide rails to conveyors; and worn pads on the jar gripper arms of the rotary capper. These contribute to container stress, and hence breakage.

What Was Done for Preserve Packer

In Case B, the causes of breakage were obvious.

First, erratic torque tightening of closures resulted in over capping, which produced severe stress in the jar finish, causing the neck of the jar to twist off.

The remedy was an adjustment of the friction clutch on the tightening chuck, using the torque-meter gage.

Second, following the filling and capping operation (where glass surface temperature is 180 deg. F. +), jars were put through a recirculating washer to remove any product spilled on the outside. The temperature of the wash water was subject to considerable variation (minimum 68 deg. F., maximum 132 deg. F.) because of periodic addition of cold water make-up. When the temperature differential exceeded 100 deg. F., a small amount of thermal shock fracture would result.

The correction was to install a continuous make-up water line and overflow pipe to the recirculating tank in order to level out temperature fluctuations (now 100-118 deg. F.).

Third, operators on semi-automatic labeling machines were impacting jars against the steel bottle rest. Breakage was proportional to the laxity of the operator. In most cases, jars would show only percussion cracks subject to fracture during later handling.

In remedying this condition, operators were taught to handle containers

(*Turn to page* 65)

Six glassware steps . . .

- **Assure gentler handling**
- **Cushion working surfaces**
- **Rid line of rough spots**
- **Synchronize line speeds**
- **Get proper closure torque**
- **Eliminate thermal shocks**

. . . to six worthy savings

- **Reduced costs on containers**
- **Smaller product losses**
- **Less down-time on line**
- **Better man-hour performance**
- **Fewer clean-ups**
- **Improved production record**

Cleaning Costs Were Drastically Cut . . .

$2,300 IS SAVED yearly by sweeping aisles and open spaces in green-coffee warehouse and on pier twice daily with this power sweeper. Previous practice was laborious hand sweeping of areas once a day.

They Get More Sanitation—Yet Spend Less

Improved equipment and methods help reduce cost of operating General Foods' stepped-up cleanliness program

CHARLES A. CLARK
Staff Assistant for Sanitation,
General Foods Corp., New York

That the costs of a sanitation program can be reduced—and cleansing services increased at the same time—has been demonstrated at the Maxwell House Coffee plant of General Foods Corp., Hoboken, N. J.

Here, by the careful scheduling of janitor work, an estimated $5,000 annual cost reduction has been effected. Moreover, by studying and standardizing cleaning materials, a further saving has resulted. Also, an advanced machine saves $2,400 a year. And a 40 percent saving in labor has been attained by substituting a special, extension-handle mop for the standard mops, ladders and scaffolds formerly used when walls inside the plant were washed.

These are but a few of the notable savings made at this plant through application of the company's forward-looking sanitation tactics. It is progress which follows GF's original concept, dating back to 1912—

"The policy of this company as respects its products and its employees is as follows:

1. To manufacture its products of such materials and under such conditions as will assure the highest quality.

2. To keep its grounds, buildings, equipment and manufacturing processes *clean and sanitary* and to obtain from all employees fullest cooperation to this end."

This basic scheme has been implemented by constantly keeping up with the most advanced thinking in matters of food plant sanitation. Before detailing the achievements at Maxwell House Coffee, let us brief the organizational working features behind them.

Sanitary Section in New York

Before the end of World War II the company's executives realized that research developments, stimulated by the war, would make possible still higher standards of food plant sanitation. Furthermore, they believed it would be necessary to make every effort to maintain the enviable reputation of the company's products in an era of increasingly severe competition—the new buyers' market.

But, in such a large and diversified food manufacturing business, with its 88 processing plants, it is difficult for word of minor sanitary improvements in one plant to reach another plant, which might be located a thousand miles away. Also it is almost impossible for each plant to keep up with all the rapid advances in this field.

Therefore, a GF Sanitation Section is maintained, with offices at the headquarters in New York City. Under the direction of a staff assistant for sanitation, its purpose is to stimulate action, coordinate efforts, act as a central clearing house, and assist the many plants in all phases of their sanitation programs.

One duty of this staff assistant is to accumulate and supply up-to-date technical information. This is obtained through contact with research

. . . When These Practices Were Introduced

$550 IS SAVED by removal of waste from soluble coffee plant in special carts handled by lift-truck.

40 PERCENT OF TIME required to wash walls is conserved by this long-handled mop. Hazards are eliminated.

workers in government agencies and other organizations, sanitation directors of other food companies, and food processing associations.

Also, membership is maintained and meetings attended, in the important associations having to do with various phases of sanitation. These include the American Assn. of Economic Entomologists, Society of American Bacteriologists, Assn. of Food Industry Sanitarians, International Assn. of Milk & Food Sanitarians, and the National Committee of Food Industry Sanitarians.

Sanitation Articles Cataloged

Appropriate magazines, such as *Soap and Sanitary Chemicals*, *Modern Sanitation*, and *Pest Control*, are routinely examined for useful information. General Foods' Central Library, through its abstract services, keeps the staff assistant posted on articles dealing with various phases of sanitation which may be treated in other publications.

Items of interest and value, from these and other sources, are promptly transmitted to the proper persons in the line organization of the several divisions, and to plant people. In most cases, this is accomplished by means of pages for the company's loose-leaf *Sanitation Manual*. If the importance of the information warrants, however, letters direct to all manufacturing plants may be used.

A second important function of the staff office is to assist with the training of plant personnel. Accordingly, an annual Sanitation Conference is held, with representatives from all the important plants or units. This conference runs from three days to a week. Practices and recommendations are reviewed, problems are discussed, experiences are exchanged, and outstanding speakers provide up-to-date information. Lectures and group discussions are supplemented by actual demonstrations in a plant. There are also visits to other food manufacturing plants.

Conferences for the training of plant workers are held at individual plants. At these, the most modern types of visual aid materials are used. Assistance is received from the training experts of the Personnel Department.

Other Duties of Staff Assistant

The staff assistant visits all plants. Frequency of such calls depends upon the size of the plant, the type of product manufactured, the kind of sanitation problems intrinsic in the operation, and numerous other factors. "Inspection" rounds are usually made primarily for searching out ways in which to further raise sanitation levels.

Average conditions in the plants are such that a "police" type of inspection is not necessary. This has been accomplished through centralization of authority and fostering responsibility in "on-the-spot" plant management.

Close contact is maintained with Food & Drug officials, because their thinking is based, to a large extent, on original research in their own or other government ageney laboratories. In this way, it is possible to keep informed on the most up-to-date viewpoints as to what constitutes a *safe* as well as an otherwise satisfactory food product. This has proved especially important in determining the proper use of new wartime-developed insecticides and other materials of a similar nature.

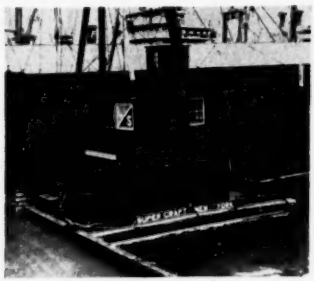
Sanitarian on Staff of Many Plants

Most of the larger company plants have a sanitarian on the staff. This is usually a full time job. But in the smaller units it may be combined with some other work, such as plant protection. The plant sanitarian reports to one of the top-level plant management officers; in smaller plants usually to the plant manager. This insures a standing commensurate with the responsibilities of the job.

Results and Accomplishments

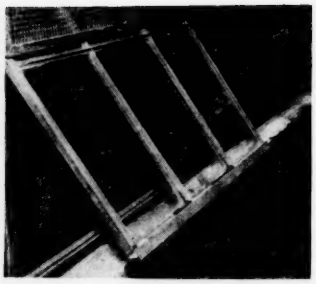
Most important result of the program is the increased determination on the part of plant people to keep the manufacturing plants clean and sanitary. This includes an active interest by plant management in all phases of sanitation, and a willingness to explore

Sanitation Is Facilitated by These Built-In Features



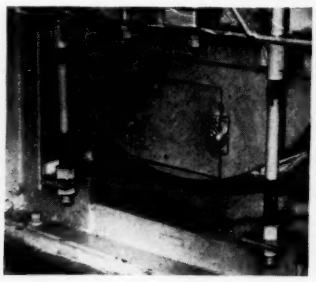
HARD SURFACED wharf keeps down dust and dirt.

SO DO PAVED driveways. While tight concrete foundations . . .



. . . **AND SCREENED** lower windows keep out rodents.

MACHINE BASES filled with concrete make cleaning job easier.



OFF-THE-FLOOR elevator boot is easily brushed out via clean-out door.

TILED ROOM is provided for washing equipment and waste containers.

and test out new methods and new materials.

People in the plants are kept sanitation-minded by means of departmental contests, articles in the company's *News Letter*, posters, and the like. Active participation has been enlisted of plant and machinery design engineers, research scientists, work simplification experts, time and motion study men, safety engineers, and training specialists.

The Moves at Maxwell

It is not possible in this article to mention all of the various improvements made in all plants. However, the following are some that were made at the Maxwell House Coffee plant in Hoboken, N. J.:

1. Sanitation began with the plant grounds. Driveways have been hard surfaced to keep down dust. Buildings were made rodent proof by assuring tight foundations, with all openings and lower windows well screened.

2. Porter (janitor) work is now carefully scheduled. Each task is listed, with its frequency established. Each porter's work is carefully outlined. This has made supervision much easier and effected an estimated $5,000 per year saving.

3. Cleaning materials have been studied and standardized. This results in fewer products to order and stock, and a better, more uniform performance on the job. A cost reduction is indicated here, but the amount has not yet been determined.

4. Walls are now being washed with a special mop attached to an extension handle. This resulted, as stated, in a 40 percent saving, largely through a reduction in "make ready" and "put away" time. Belief is that elimination of ladders or scaffolds is highly important.

5. In the green-coffee storage warehouse, and on the pier, there are long aisles and large open areas totaling over 35,000 sq. ft.—which were hand-swept once daily. This job is now done twice daily with a power sweeper at a saving of $2,300 per year.

In several smaller plants, a hand-propelled mechanical sweeper costing less than $100 is used. It permits one man to sweep larger areas more often than by the hand-broom method formerly used.

6. Use of a power scrubber, purchased at a cost of approximately $2,000, has cut mopping costs by fully $2,400 per year. Savings would have been considerably higher had not mopping of more areas at greater frequency been the rule following acquisition of the new machine.

7. Waste from the soluble coffee plant is handled in 12 specially designed dump carts. They are handled by lift trucks normally used for other purposes, and, at a savings of $550 over the previous method.

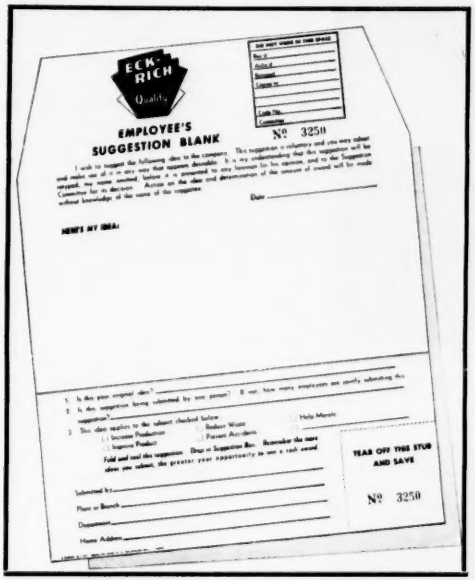
8. Bases of machines have been filled with concrete where possible, thus making cleaning easier. Design engineers have provided for off-the-floor elevator boots with large doors for easy clean-out.

9. Convenient wash-up rooms for equipment—portable bins, waste containers, and the like—are provided.

10. Not all improvements result in cost reduction but may be justified by the additional sanitation effected. For example a food handler's training course for all cafeteria employees has, it's believed, reduced the likelihood of a food poisoning outbreak. Cafeteria inspections are made regularly, utilizing the Standard U. S. Public Health Service Inspection Form.

Other improvements have contributed in the maintenance of a clean 1948 plant—with the housekeeping costs slightly under those for 1947 in spite of increased wage rates. Similar progress in other company units has more than justified the corporate and individual plant sanitation activities. All told, the program has demonstrated its worth as an intrinsic part of our modern food plant operation.

Savings Starting Point: The blank . . .



. . . and the box

Cost Cutting by the Suggestion Plan

System increases production, reduces waste, improves quality of products and cuts accidents. Especially, it promotes better employee relations

H. E. KIBBEY
Kalamazoo, Mich.

It pays—all along the line—to adopt a suggestion plan. Experience at Peter Eckrich & Sons, Inc., manufacturer of sausages and luncheon meats, with large plants located at Fort Wayne, Ind., and Kalamazoo, Mich., demonstrated this during the past several years.

The plan's specific target is better employee relations—and it does get results. The notable additional benefits derived are lower operating costs, better quality products, higher production rates, and fewer accidents.

Originally set up in September of 1945 by Lavern E. Gelow, personnel and advertising manager of the Eckrich plants, this project has more than fulfilled company expectations. Its success is attributed to the careful attention paid by management to working out details.

A check shows that the plan has earned the employees' respect—indicated by the fact that no less than 1,482 suggestions have been received.

Of this total, the company has accepted 475 to date—in short, better than one out of every three ideas proved usable. Flow of ideas at present is unceasing, and general quality of the ideas is improving. For the 475 ideas that "scored," the firm has paid the employees $6,703.97 during the 3½ years the suggestion boxes have been set up.

Largest amount paid for a suggestion was $680.79. Within the concept of the plan, $5.00 is the minimum rate. However, the company doesn't forget the employee who submits what cannot be called a full-fledged suggestion, hence there have been smaller payments. Insofar as possible, payment for ideas is mathematically calculated by the suggestion committees on the basis of savings to the company. The employee receives 33⅓ percent of the first year's savings.

Suggestions particularly sought by the company are those that increase production, improve products, reduce waste, prevent accidents, and help morale. Ideas dropped into the suggestion boxes at the different plants have proved as varied and interesting as the individuals who thought them up. A number of them will be mentioned in the following paragraphs, and readers will find them full of valuable tips.

Ideas That Were Rewarded

For instance, Sam Landin, at the Fort Wayne plant, suggested that a cover be designed for a specific meat grinding unit. While working at this grinder, he had noted that small lumps and pieces of meat were continually being tossed over the sides and onto the floor. The committee checked his suggestion with the department supervisor. And upon totaling what this seemingly small waste amounted to over a period of a year, the committee awarded Landin $163.00.

At the Kalamazoo plant, Ed Kudzia wondered why employees were served salable sandwich meat during refreshment periods when they could have used unsalable meats (with cracked and split casings). A small thing? Seem-

Workers' suggestions are weighed . . .

COMMITTEE acts on suggestion. Left to right: L. Gelow, personnel mgr.; J. J. Helmkamp, sales mgr.; A. E. Dirig, asst. supt., shipping dept.; L. Eckrich Fritz, purchasing agent; and E. J. Baker, controller.

. . . and pleased winners cash in

TOP AWARD of $680.79 is presented by C. P. Eckrich to lucky co-winners—John Potgiesser, Gilbert Gaudie and Helen Braat (Ed Kudzia was on vacation). Their new economical way of handling seasonings hit this jackpot.

ingly, but it had been overlooked under pressure of production. The suggestion paid him $27.47.

All departments come under the plan. Edna Moore and Catherine Eastman of the Fort Wayne office staff suggested that certain office forms be revised to cut down on the amount of clerical work. As a result, these alert girls received identical checks for $50.00.

A seemingly simple idea—a knot—brought Alida Klomp of the Kalamazoo plant a $180.95 check. For tying sausage casings, she devised a knot that incorporated a loop for hanging cased meats from smoke racks. Thus, a retying job was eliminated.

Maurice Klop, with the Kalamazoo branch, suggested building a special dock, with a door cut through the building to it, at the company's distributing building in Jackson, Mich. This, he thought, would simplify unloading of semi-trailers. The company thought so, too, and he got $25.00.

The company booklet, *Suggest and Collect*, specifies that all employees, either at one of the plants or a branch, are eligible for awards. The only exception relates to the supervisory employee. If he is ranked as a superintendent or higher, or if he has the authority to put his idea into operation, or if his idea relates to a matter coming under his supervision, he's not eligible.

But superintendents are encouraged to help their workers in working up their proposals. The number of awards granted to employees under his supervision is credited to each supervisor and reacts to his benefit.

Neil Moerman, a supervisor at Kalamazoo, not normally eligible for an award, got one. He spotted a floor area in the stuffing room that was badly worn. However, the floor itself was free from cracks and the floor blocks were good. So he suggested that the area be levelled off with a grinding machine similar to one used for terrazzo floors. Technically, it was not within his power to have floors re-worked, so he received $200.00 for his money-saving suggestion.

Many employees have received multiple awards. Bert Clemens, for instance. He pointed out on his suggestion form that teeth on the smoking racks caused many accidents. These teeth held the smoke sticks in position. But he suggested using fluted angle irons to retain the sticks. This was done. And meanwhile, Clemens also suggested installing a fluorescent light in a telephone room. For each of these ideas the company paid him $10.00.

Harold Ten Brink, of the Kalamazoo plant, is another double winner. He thought the arrangement in the cooking and smoking department was not efficient. He suggested changing operations to provide for smoother production flow. And his revision—definitely better—brought him a $200.00 check. He also helped improve the method of cooking braunschweiger or liver sausage. His award in this case was $40.00.

Now, for the topper of them all: J. Potgiesser, Helen Braat, Edward Kudzia and G. Gaudie were awarded $680.79 for a suggestion on handling seasonings more conveniently and economically at the Kalamazoo plant.

So the awards go. Big or small, the feeling of satisfaction the employee gets predominates. These intangible results are important. The man or woman who has had a suggestion accepted feels that he or she has helped the company—an attitude that helps weld employees together.

How System Works

Suggestion blanks are addressed to the personnel manager, at the Fort Wayne, Ind., plant. The blanks are trimmed so that they can be folded and sealed by a gummed flap. Each carries an identifying serial number on a perforated stub in the lower corner. Thus, an employee need not sign his name, unless he wants to. The blank contains spaces, or squares, which must be checked as to the type of suggestion: To increase production, improve product, reduce waste, prevent accidents, or help morale. In addition, there is a space to be filled in for an idea that does not fall under the above classifications.

Twice weekly, suggestions are taken from the boxes at the Fort Wayne and

Kalamazoo plants. Those from Kalamazoo are forwarded to Fort Wayne. Here, the suggestions are read, dated, the code number noted, and acknowledgment certificates sent to those workers who identified themselves. Spelling and wording are corrected, where necessary, so that the suggestions will be judged on merit alone.

Then the suggestion reports are forwarded to supervisors most interested in the idea. The supervisors are requested to report whether they think the main idea or any part of the suggestion is practical.

Also, the supervisors are asked to figure the cost of the investment, if the idea is usable. In addition, they are requested to estimate the benefits.

Returned to the suggestion chairman, with the reports attached, the forms are referred to the appropriate suggestion committee (there are two). Each suggestion is then discussed.

If it is considered good and the committee votes to accept it, the amount of the award is determined. It is then that the name of the worker submitting the suggestion is announced to the committee. Up to that time, names are not revealed.

Keep Workers Informed

If there is any delay in acting upon the idea, a postcard, with space for quick checking by the chairman of the committee, is sent to the person who turned in the suggestion.

Once the suggestion has been accepted by the committee, the contributor is notified. Or if it was anonymous, notice of acceptance is posted, by number, for not less than 30 days on the bulletin board in the plant where the idea originated.

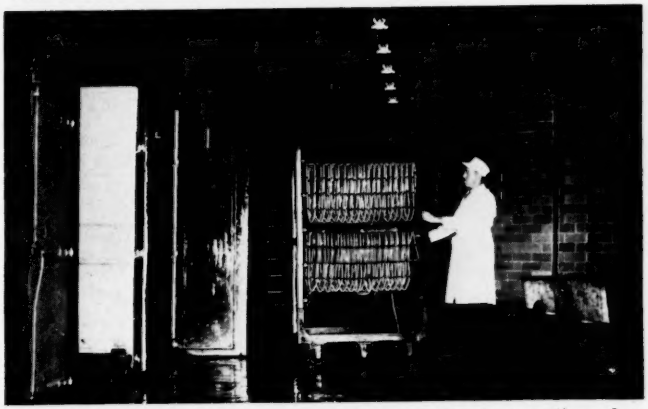
In addition to the monetary award, a nicely printed certificate is presented to each contributor. Also, awards are mentioned in the next issue of the company publication, *The Red Hot*.

The previously mentioned booklet, *Suggest and Collect*, is an attractive presentation, recently printed, that will shortly be mailed direct to the homes of all employees. It is printed in three colors and cleverly illustrated with cartoons.

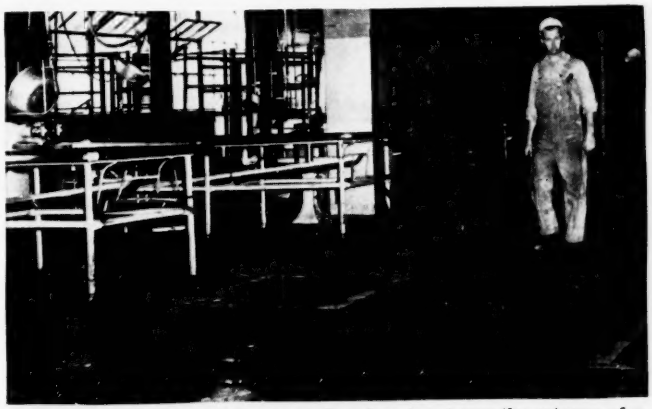
This booklet explains: (1) How better working methods mean higher productivity, making possible a higher level of earnings, (2) how modern production methods—because they make possible wider distribution of reasonably priced products—benefit Eckrich employees; and (3) how the supervisory force will help any employee to work up his suggestion.

In mailing this small book, the company signifies its belief in the suggestion box as a means of getting its employees to take a meaningful part in the growth of their organization.

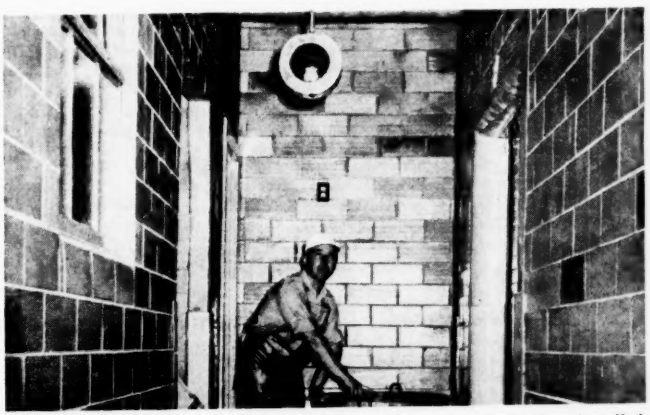
Three Ideas That Boosted Efficiency



MORE SPACE, higher production resulted, after employee's suggestion, when cookers were re-located (left) in smoking-and-cooking department.



THIS SMOOTHER FLOOR in the stuffing department was the outcome of a worker's suggestion to machine-grind the badly worn areas.



ACCIDENTS were reduced after company, acting on worker's idea, installed photoelectric cell-operated stoplight (top) in this heavy-traffic area.

REMINDER on dashboard, with its white lettering on blue background, provides a STOP sign driver can't miss.

"Stop the Motor" Plays a $24,000 Tune

Campaign to turn ignition key at all stops adds up to a whacking slash in

WOULD YOU think that any company could save $24,000 a year on its gasoline bill largely by having its truck drivers shut off their engines at every stop?

That saving was actually accomplished by Chicago's Bowman Dairy Co. with its fleet of approximately 1,500 trucks over the year from June 1948 to May 1949.

Those of us who drive passenger cars know that we are wasting gasoline when we let our engines idle while the car is stopped for a few minutes at intervals throughout the day. But we pass off the waste as small, figuring it to be more than offset by the additional battery and starter wear and the repairs that more frequent use would entail.

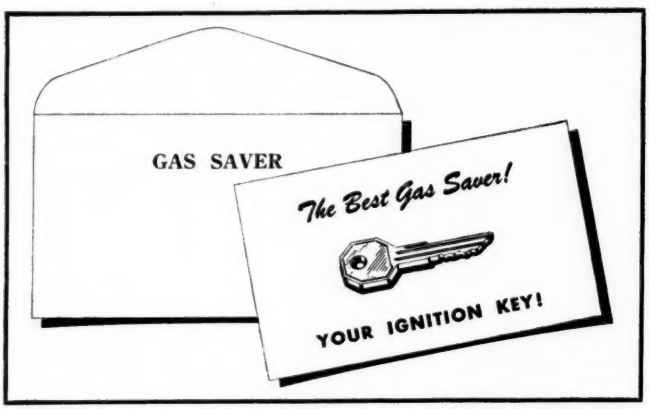
But with a truck, frequent stops are essential in order to make deliveries. And the small saving realized on one truck may develop into total savings amounting to a great deal of money when multiplied by the total number of vehicles in the fleet.

With 1,500 trucks in its fleet, the Bowman company had a worthy figure to multiply—and the result was the $24,000 yearly gasoline saving.

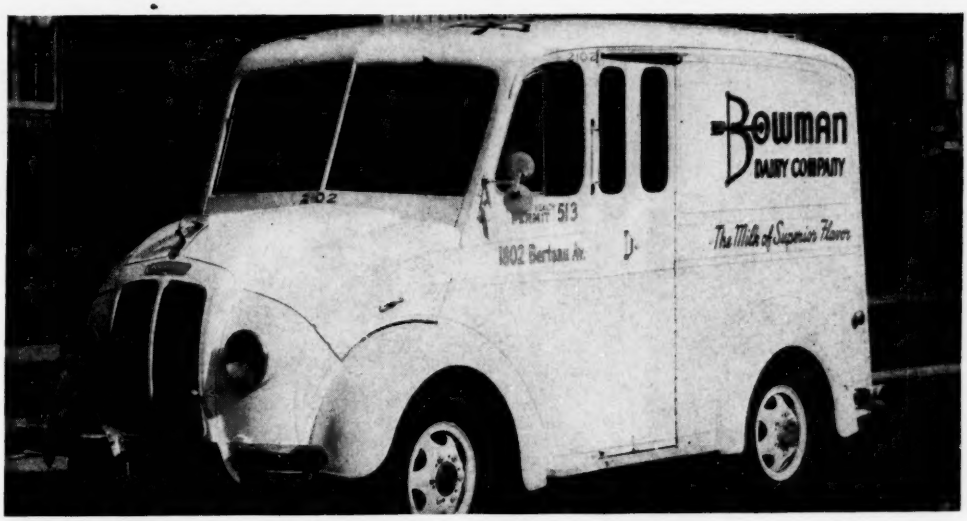
This fleet consists of about 250 large size wholesale and store delivery trucks and 1,250 smaller retail residential route trucks. The fleet runs about 800,000 mi. a month, operating from 13 separate sales division plants.

From the very beginning, the dairy believed that some saving was possible if its driver-salesmen could be induced to shut off their engines at every stop. But there was no certainty that the matter was that simple. Disadvantages might develop which would nullify the anticipated economies. Accordingly, the company conducted a two-month preliminary test at a single plant. Here, 172 trucks were operated.

Since no new equipment, tools or devices of any kind are involved in the plan, the first essential to its success was to gain the interest and cooperation of the sales-fleet foremen, the shop maintenance foremen and, of course, the drivers themselves. In effect, the plan asks each driver to change one of his driving habits.



IGNITION key cards distributed in "Gas Saver" envelopes, plus dashboard signs, were the only expense items involved in this cost cutting campaign.



ADD UP the stops made by 1,250 of these trucks plus 250 wholesale units, and idling motors become costly.

For This 1,500-Truck Dairy Fleet

Bowman's retail and wholesale milk distribution costs throughout Chicago area

When a driver has regularly let his engine idle during delivery stops—over a period of 10, 15 or 20 years, or as long as he has been with the company—it is not easy for him to make a sudden change in the habit. And so, the plan had to reflect a good understanding of human nature. First, of course, the interest and cooperation of the drivers and supervisors had to be gained, and then the program had to provide constant reminders to the drivers to shut off their engines and to continue in their new habit once the newness and enthusiasm of the plan had worn off.

To do this constant reminding, two pieces of printed matter were finally selected. The first was a blue gummed sticker about 3½ in. in diameter, with the words: "Shut Off Your Motor Every Stop" in white letters. This sticker was applied on the left side of the dash panel of every truck. Here, it was always in front of the driver's eyes.

The second piece of printed matter was a 3½ by 6 in. white card with a picture of an ignition key and the words: "The Best Gas Saver! Your Ignition Key!" These ignition key cards were distributed inside white envelopes bearing the words: "Gas Saver" on the front.

At some company branches, the route foremen personally handed out these envelopes to the driver-salesmen. At other branches, the envelopes were placed in the pigeonholes where the drivers picked up their route books.

Idea "Sold" to Drivers

During the first two-month test of the plan, the men made many comments and not a few jokes about the cards. Nevertheless, they "sold" the idea and accomplished their purpose. The gasoline savings that resulted during the test were so encouraging, with no nullifying disadvantages, that the plan was extended to all trucks in the fleet. Subsequently, the year from June 1948 to May 1949 showed the gross gasoline saving aforementioned—a good, solid $24,000. The only tangible expense was the $150 outlay for the printed matter.

To retain the interest of the men throughout the second year of the plan, the company expects to replace the blue dash-panel sticker with a new one made up from the ignition key card in a size 2½ x 4 in.

The Bowman company attributes the big 1948–1949 saving principally to the excellent cooperation of its drivers and supervisors in seeing that the truck engines were shut off during the many delivery stops, no matter of how short duration.

The company also gives credit to a stepped-up preventive maintenance program on the trucks. Moreover, Chicagoland's comparatively mild 1948-1949 winter is also cited. Bad winters with much sub-zero weather and lots of snow may reduce the amount of gasoline saved during the winter months.

During the initial year of the plan's operation, none of the anticipated disadvantages developed. On the contrary, some additional advantages came to light.

Run-down batteries were not so frequent, thus saving on route service calls. It was noted that the old idling had constituted some drain on the batteries, since there is very little, if any, charging when "she's just turning over." Granted, the engine must be started anew after each stop. But engine and oil keep warm during the comparatively short stops, hence the kick-over doesn't take much from the battery. Weighing both sides of the question indicated a saving under the new plan.

Another benefit concerns motor oil condition. Without the stop-idling, there has been less oil dilution and sludge formation. Also considered is the wear of engine parts during idling. This, too, adds up over 1,500 trucks, and now it's eliminated.

This low production . . . **. . . was first upped 50 percent . . .**

OLD. Asparagus cartoning was initially slow. Packer had tedious 3-in-1 job of selecting spears from jumble, pre-arranging them, and finally packing.

BETTER. Then revision in system made separate job of sorting and pre-arranging, and packers just had to carton the spears, delivered to them ready-arranged on the tote pans. This change boosted production half-again.

Continuous Packing Line Triples Output

What's more, labor is halved and work simplified by advanced system. And wage-incentive plan aiso plays vital role

JOHN V. ZIEMBA
Assistant Editor, "Food Industries"

Faced with increasing demand for its frozen asparagus spears, Seabrook Farms, Bridgeton, N. J., had to devise ways to increase its asparagus pack. And this increase had to be achieved with less help, because it was necessary to transfer some of the workers to the company's higher-volume frozen pea lines.

After a careful analysis of the asparagus-packing work, productivity per girl-hour was increased by eliminating waste effort. Furthermore, by switching packing operations from batch to continuous, the number of workers required was reduced by more than half.

Particularly notable have been the cost-cutting benefits derived from these improvements.

There were two major stages in the company's achievement: First, the job of sorting and pre-arranging (prior arrangement of the spears so they can be packed tightly into cartons in an orderly fashion) was separated from packing. This increased production half again, nearly 50 percent.

Second, narrow rubber-belt conveyors were installed to deliver the pre-arranged spears directly to the packing station. And efficiency was further increased by introduction of a group wage-incentive plan for the workers. These changes actually tripled the original output.

Advantages Summed Up

A check of the new system over the old showed these nine important dividends:

1. Reduced by nearly 30 percent floor space required to pack asparagus.
2. Made working conditions easier for the personnel.
3. Cut down materially on the amount of damaged spears.
4. Shortened produet travel.
5. Changed production from batch to a continuous straightline flow of material.
6. Eliminated use of tote pans and flat trucks.
7. Provided flexibility (broccoli can be handled on the same line).
8. Assured sufficient help to handle the larger-volume pea pack during peak periods.
9. Enabled the company to turn out a greater volume of the harder-to-pack long spears (as differentiated from the easier-to-pack cut-up spears) and to do it at lower cost.

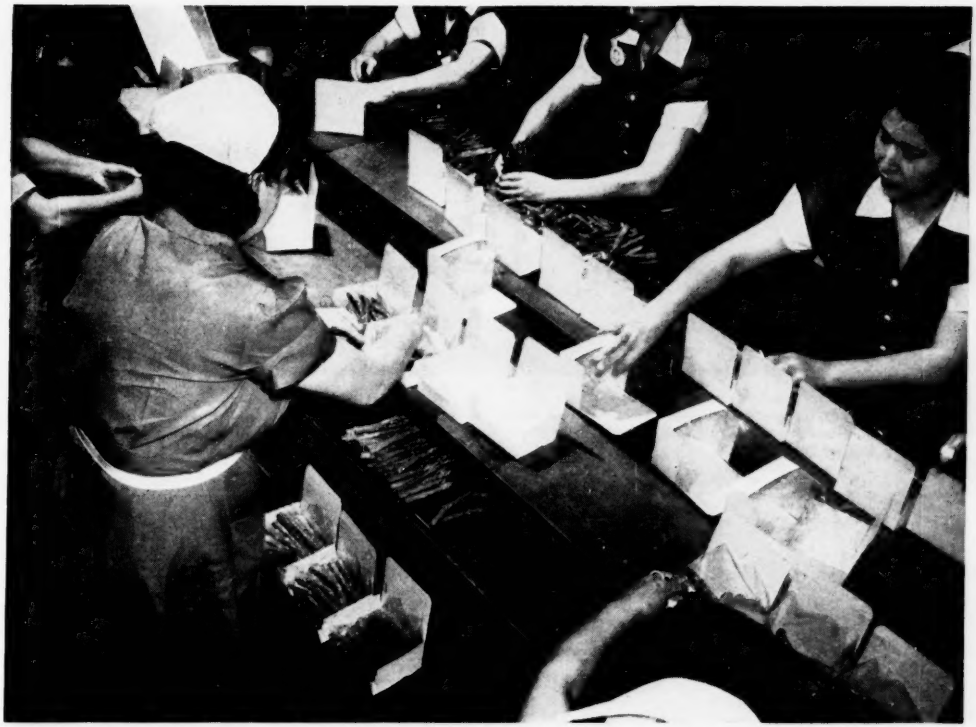
Old Method Was Slow

But let us tell the story of these efficiency changes from the beginning:

In the old method of packing asparagus, a rubber-belt conveyor carried the spears from the steam blancher and water cooler to a collection station. Here, the spears tumbled at random into rectangular perforated-bottom, stainless-steel tote pans.

An operator collected about 25 lb.

. . . then 300 percent!



BETTER YET. And now today, continuous conveyor system has raised output to three times that of old method. Spears are belted directly to packers, arriving pre-arranged, ready for cartons. Tote pans are "out."

of spears into each tote pan, then loaded 15 pans onto a flat truck. Another worker hauled this truckload of spears 50 to 100 ft. to the hand-packing lines, and returned to the collection station with a truckload of empty tote pans. Still another worker serviced the packers by unloading filled pans from the truck and placing them upon an angle-iron rack at the packing line. The same worker removed empty pans from the line and loaded them onto flat trucks.

Packers selected the spears that were jumbled in tote pans, discarding asparagus with damaged heads. Then the spears were pre-arranged and packed into the cartons, which came to the girls on a conveyor. Next, the filled cartons were placed on a wire-mesh conveyor, running in the center of the packing table and carrying them to the weighing, closing, wrapping and freezing stations.

Output Upped 50 Percent

By merely separating the sorting and pre-arranging work from packing, production was, as stated, stepped up almost one-half. Instead of the packers doing all three jobs—as in the old method—spears were delivered to them pre-arranged in tote pans, all ready to be filled into the cartons.

No longer were asparagus spears jumbled as they were collected into tote pans. Instead, a 36-in.-wide rubber-belt conveyor delivered the spears directly from the cooler to the pre-arranging station. Here, facing the conveyor, girls sorted. And, making a half-pivot turn, they pre-arranged the spears into the tote pans. Workers finally loaded the pans onto flat trucks, which they then pushed to the packing stations.

The girls at these stations quickly agreed that the job of packing the pre-arranged spears into cartons, was easier and less fatiguing.

Increased productivity was achieved by this improved method—and with fewer workers. Each of the three jobs—sorting, pre-arranging and packing—was done with less help.

Besides raising production and cutting labor, the number of damaged spears (heads broken off) was greatly reduced by virtue of the gentler transfer of the asparagus from the cooler-conveyor to the rubber-belt conveyor traveling along the sorting and pre-arranging table.

Productivity Tripled

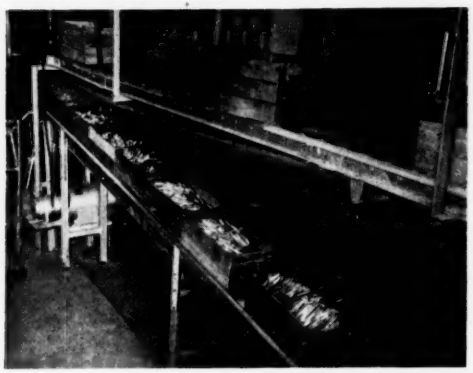
While this system was much better, it actually was only a start on the road to improvement. By continuing the conveying system, through the pre-arranging station, directly to the packing table, output was increased to more than three times that of the original system.

In this highly efficient, continuous straight-line flow, there no longer is any need to collect asparagus in tote pans or to pre-arrange the spears in these pans. Furthermore, the product does not have to be truck-transported to packing stations and supplied to the packers. And accordingly, the men formerly required to handle the asparagus pans have been freed for other work.

Here are further pertinent details concerning the new system and how it operates:

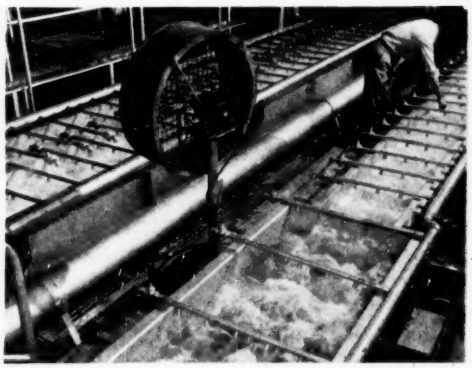
First, a 36-in. wide rubber-belt conveyor carries jumbled asparagus spears from the blancher-cooler along

From Raw Spears to Finished Package



1 TRUCKED from nearby fields, boxes holding about 30 lb. of asparagus are graded and then conveyed into plant. Empties (seen top) are going back to loading dock, where they are stacked, 30 to a pallet.

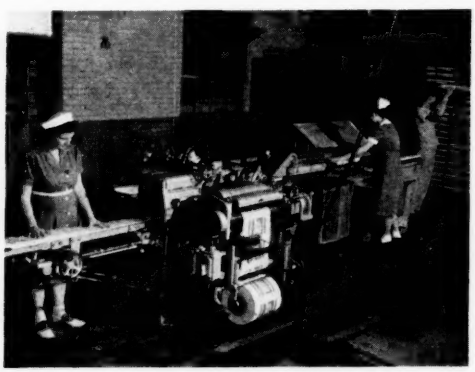
2 CIRCULAR KNIVES (screened, top) cut asparagus into spears, center cuts, and butts. Girls discard damaged spear-heads and separate white from green center cuts. The white cuts go to a waste flume.



3 LONG parallel flumes, equipped with a series of regularly-spaced water sprays, thoroughly cleanse asparagus spears as they travel toward steam blancher. Flumes are 10 in. wide, contain 5 in. of water.

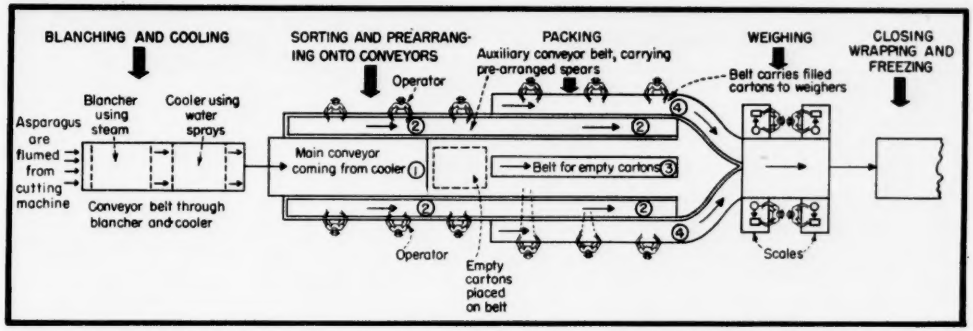
4 FROM COOLER, blanched spears are carried on belt to this pre-arranging station. Here, spears are sorted, bunched and put on belt going to packers. This step is the key to the whole labor-saving operation.

5 TO THIS weighing and closing station come spear-filled cartons from efficient, multi-conveyor packing station (already pictured on preceding page).



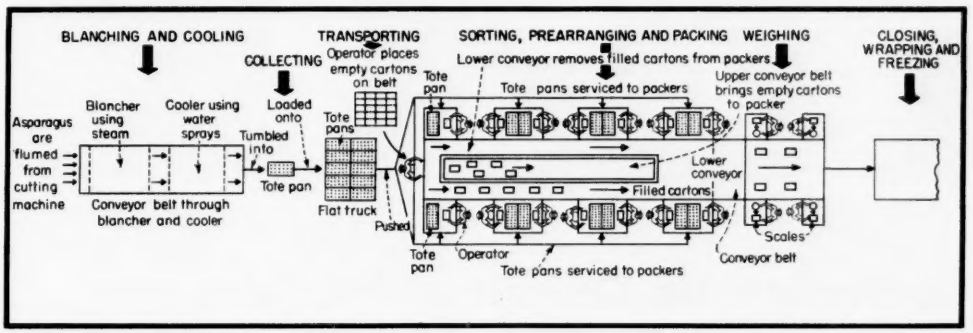
6 FED to machine, cartons are overwrapped with wax paper at a 60-a-minute rate. Cartons are put on trays that are loaded into racks going to freezers.

QUICK PROOF OF PROGRESS: Speedier, more productive continuous line . . .



Conveyor system did the trick. Belt (1) takes spears from blancher-cooler to pre-arranging station. Lined-up spears go on belts (2) to packing station. Belt (3) feeds empty cartons to packers. And spear-filled cartons travel on belts (4) through weighing and closing station to automatic carton-wrapping machine. Quick freezing is final step.

. . . versus slow, laborious batch line



Tote-pan-punctuated old line was inefficient. Spears had to be collected into pans and trucked to packing station. Then pans had to be serviced to girls. And empty pans had to be gathered and returned for refilling.

the center of the pre-arranging station. Girls on each side of this 36-in. belt sort, pre-arrange, and place the bunches of spears on a 6-in-wide belt—on either side of the center 36-in. belt.

The two narrow belts deliver the bunches to the packing station. Damaged spears are discarded into pans, adjacent to each worker.

Second, handlings at the packing station have been reduced. Packers pick up empty cartons delivered to them on a 12-in. belt running along the center of the table. Next the pre-arranged spears from the 6-in. belts are packed into the cartons. Finally, the filled cartons are discharged onto a third rubber-belt conveyor, running below the table, and delivered to the weighing station.

The company is not resting on these laurels. Plans are already underway to increase production further through the installation of carton-forming and carton-closing machines. Also slated is an individual incentive plan to take the place of the present group plan.

Glass Breakage Costs Cut

—Continued from page 53

with more care. This reduced impact stress. And now, a redesigned bottle rest of soft metal is being added.

Assuming that the glass industry sells 100,000,000 gross of containers per year, and that breakage from assignable causes not related to manufacturing defects is 0.05 percent, the computed losses would amount to 50,000 gross per annum. In time, materials, and lost production, the money represented must be highly significant. Hence, grappling with the problems of breakage and finding solutions comprise a means of cost reduction.

It should be remembered that while glass containers are made strong and will remain strong if properly handled, they still are subject to breakage. Remember, too, that once a jar has been weakened by scratching, abrasion, or impacting, it may fail at some subsequent point in its life cycle where the service does not appear severe.

And remember, further, that there is nothing mysterious about glass. Only the food processor's lack of knowledge, and sometimes his misinformation, create the mystery. For example, an investigation of a new glass-breakage problem invariably gets under way with the glass technologist being questioned about defective annealing of the ware. In the process of glass-container manufacture, annealing is such an important factor and is so carefully controlled and checked, that present-day glass technologists virtually never encounter poor annealing in the field.

On other occasions, these technologists face contentions that their glass formula is wrong. In one particular glass manufacturing plant, where records are available covering the past three years, the chemical-analysis data and density comparison checks show the glass-batch composition to be in control for the entire period.

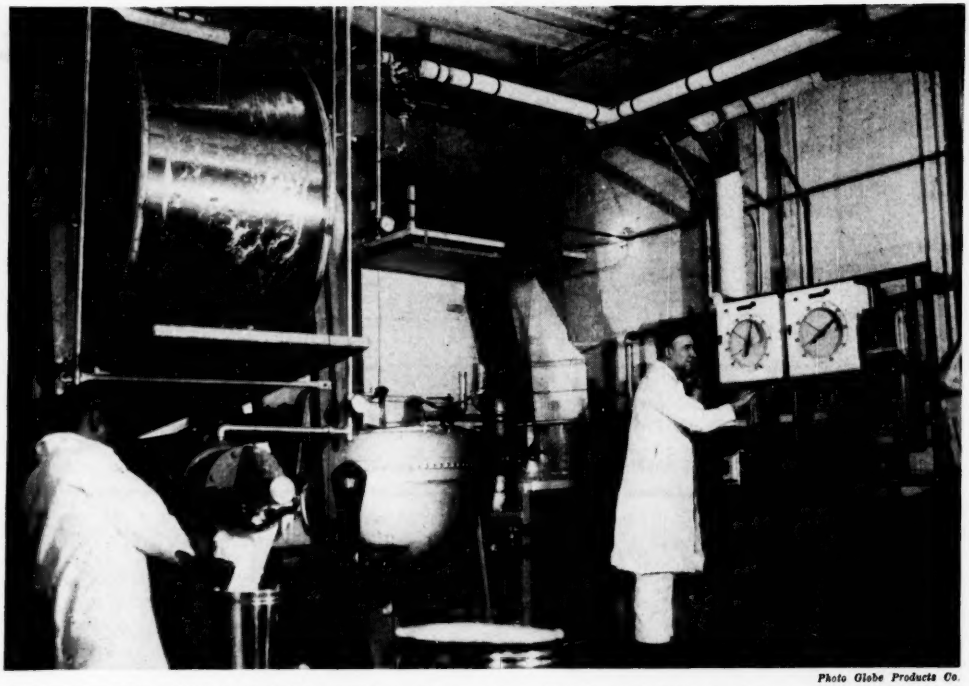


Photo Globe Products Co.

POTENTIOMETERS (right) control temperatures in pre-cook kettles (center) used for continuous fondant making.

Controllers Up Output and Quality

Advanced instrumentation speeds unit processes, provides close watch on quality, and reduces need for skilled workers in candy plants

LLOYD SLATER and JACK MEYER
Food Industry Engineers, Minneapolis-Honeywell Regulator Co, Philadelphia

One of the most advanced innovations successfully adopted by the candy industry in recent years is the use of measuring and controlling instruments to supplement the human judgment and experience of the candymaker.

There are many factors that have brought about this change. To name a few: The decline in skilled confectioners, the trend toward high-speed continuous processes, and the increasing size of candy-making operations to meet the modern demand.

In the past, skilled and experienced candy workers had to devote constant attention in making a batch of candy, by interpreting readings from stem thermometers, sling psychrometers, refractometers and viscometers. Devices that adjust valves or dampers on equipment and meter ingredients give close control over consistency and quality in the final product.

Under present conditions, however, the proportion of skilled men in the candy plant has decreased so that individual supervision of each batch of candy is no longer possible. Then, too, many of the batch operations have been replaced by continuous processes which cannot easily be inspected and corrected by periodic adjustment.

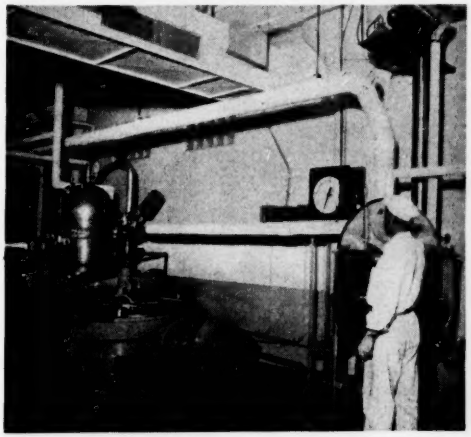
Thus, the logical and inevitable development has brought the use of instruments to measure and record process variables, such as temperature, pressure, density, viscosity, flow, color and humidity. By making these measuring units operate under automatic control, process variables are maintained at the desired levels. In this way, the few expert candy-makers available can exercise better control over a larger number of processes.

How Variables Are Measured

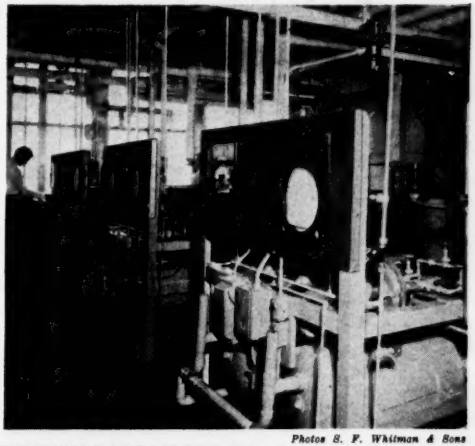
First step in controlling any operation is to measure significant variables during processing. In some cases, the more familiar types of thermometers are used for this purpose. However, confectioners have found that critical temperature-measuring problems can be solved by the modern electronic potentiometer. This instrument can measure 20-deg.-F. spans to an accuracy of better than $\frac{1}{8}$ deg.

When either a thermocouple or a resistance thermometer is used as the sensing element, the all-wire connec-

Instruments Measure and Record Temperatures During These Operations



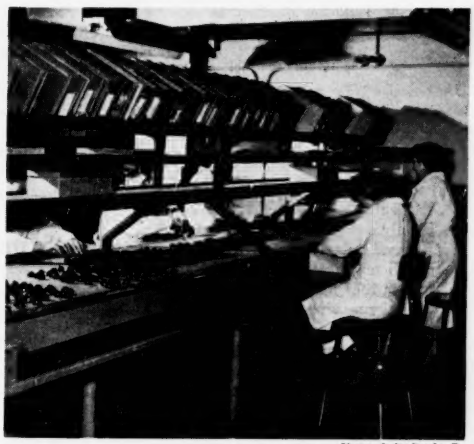
MAKING CREAM MIX. Operator uses stem thermometer to double-check candy cream mix cooked in stainless steel kettle (right). Mix is then concentrated in vacuum kettle (left), cooled, and textured in beater (lower left).



Photos S. F. Whitman & Sons

TEMPERING CHOCOLATE. Time-Pattern transmitter and controlling thermometer on panel regulate temperature of tempering water in mixing tanks behind panel. Controller (above panel) sounds alarm when air supply fails.

ENROBING CANDY CENTERS. Placed on moving belt, candy centers are coated on these four enrobers. Temperature and humidity of enrobing room, regulated by non-indicating controllers, are recorded on central instruments.



Photos Loft Candy Co.

PACKING CHOCOLATES. Coming out of cooling tunnel (right, center), chocolate-coated candies are hand-packed into cartons. Recording instruments keep check on humidity and temperature in air-conditioned packing room.

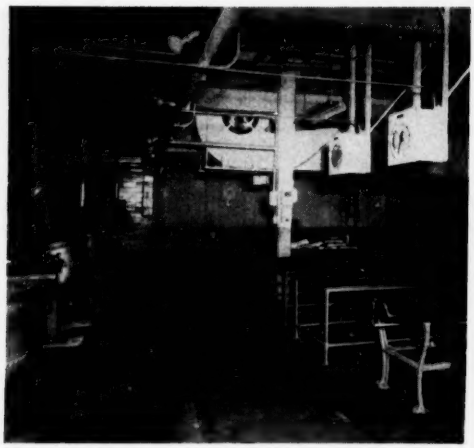
tions permit installation of the measuring instrument in convenient locations, any distance from the actual process. In this way, instrumentation can be centralized, making it possible for the candymaker to supervise a number of the processes from one location.

Due to the great variety of sensing elements available, this instrument can be used to measure temperatures in locations where thermometers are unsuitable. A kettle equipped with rotating agitators is one example, for often there is no provision for mounting a thermometer bulb.

Before electronic instruments were adopted, the only method of measuring temperatures in kettles that were agitated was to stop the agitator periodically, dip a stem thermometer into the batch, and take a reading. Now this is no longer necessary, for a thermocouple can be mounted on the center shaft of the agitator, rotating with the blade and transmitting its voltage-output through a commutator at the top of the kettle. And because of the continuous movement of the thermocouple during agitation, a coating of candy does not build up on it and slow down its speed of response.

Thermocouples are merely two wires of dissimilar metals, welded together at the point of measurement to produce a voltage that varies with the temperature at this point. They can be made in a number of special forms. And their output can be transmitted to the measuring instrument by various methods, thus solving problems in temperature measurement where the

Potentiometers Control Cooking of Hard Candies and Caramels



PREPARING HARD CANDIES. Electronic potentiometers (right) at S. F. Whitman & Son plant indicate end-point of cooking process carried out in vacuum kettles (left).

COOKING CARAMELS. These caramel-cooking kettles at Loft Candy Co.'s plant are equipped with electronic potentiometers for controlling end-point of the cook.

bulkier, less flexible pressure-type thermometer could not possibly be employed.

Jacket-Water Temperature Control

In cases where processing is conducted by controlling the temperature of heating or cooling water flowing around a jacketed kettle, thermocouples can be used. These couples only have to be a fraction of an inch long. And they can be mounted where there is only a slight clearance between the inner and outer jacket walls.

Although temperature is the principal variable that must be measured to control candy-making processes, other important factors can also be measured —with the electronic potentiometer. In fact, any variable that can be translated into terms of increasing or decreasing electrical voltage can be gaged and used as a basis for control by this instrument. By employing special sensing elements, the list of variables has been extended to include almost every important one in the confectionery industry.

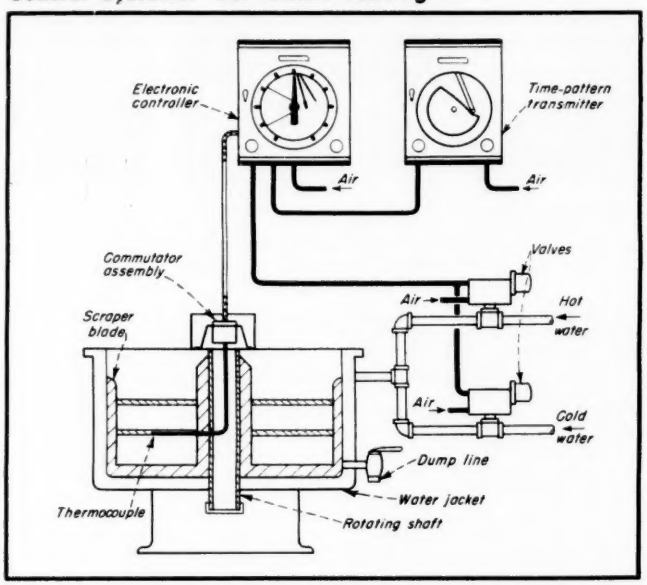
The electronic potentiometer — which uses a powerful electric motor to balance the unknown (thermocouple) voltage against a known voltage—is an ideal instrument for process control. Reasonable loads on this motor will not affect the accuracy or sensitivity of measurement. Thus, mercury switches, other electric-control units and air-control mechanisms can be used, as needed, to obtain a variety of control actions.

The accurate, dependable, flexible control thus provided enables the candymaker to turn out a higher quality, more uniform product—duplicating conditions exactly from batch-to-batch or throughout the "run" of a continuous process.

A typical operation requiring complex control that can be provided by the electronic potentiometer, is the manufacture of boiled candy. Here, the original combination of ingredients is boiled at a high temperature, additional ingredients are added at a predetermined point, and the candy is then brought to a different final temperature.

This sequence of operations—other than the filling of the kettle and the addition of ingredients—can be accomplished with the use of one "ElectroniK" instrument, a relay, a push-button station, and the necessary control valve. The push-button will start the boiling. And upon reaching the first boil, a contact in the instrument will close the steam valve and energize

Control Systems: For cream making . . .



a signal light to tell the operator to add ingredients. When the contents of the kettle drop to a predetermined temperature, the instrument, through another self-contained electric contact, will reopen the steam valve and bring the kettle to the desired end temperature. At this point, another light in the instrument case will go on, and the operator can dump the batch.

Thus, accurate regulation of a fairly complex sequence of operations can be assured, batch-after-batch, merely by pushing a button. A harried worker, taking care of a number of kettles requiring this attention, cannot be criticized if he does not achieve split-degree performance throughout the day. The instrument, however, is not subject to this human error. Exactly duplicated conditions from batch-to-batch naturally follow, resulting in greater uniformity and higher quality.

Chocolate Processing Problems

One of the oldest and most troublesome problems of the confectionery industry has been the manufacture of chocolate that retains its natural, appetizing, dark-brown color when under adverse storage conditions. "Blooming", or whitening of chocolates, may be caused by a number of factors. But one of the first steps in its prevention is to "temper" the chocolate by heat treating and agitating it. Such treatment thoroughly blends the mixture of cacao fats. In addition to blending these high melting-point fats into a homogeneous mixture, thus retarding their subsequent separation and discoloration at moderately warm storage temperatures, proper tempering also produces the desired color and texture in the finished product.

For many years, this critical operation has been dependent upon the skill of expert temperers. Their long experience enabled them to interpret the almost imperceptible changes in the color and texture of melted chocolate and make the appropriate process adjustments to produce fairly uniform results. However, the difficulty of obtaining the services of these experienced temperers in the numbers needed for large-scale operations, has led a number of companies in recent years to seek means of automatically carrying out this process.

Automatic Chocolate Tempering

Preliminary investigations revealed that there was an average tempering cycle, or pattern of time-temperature treatment, that would give good results for each blend of chocolate. Although individual temperers might vary widely from this cycle and still obtain good results, it was established that adherence to this pattern would produce results that were uniform—as good as those obtained in the conventional manner. The problem then was simplified to finding mechanical devices to give dependable, automatic reproduction of this cycle.

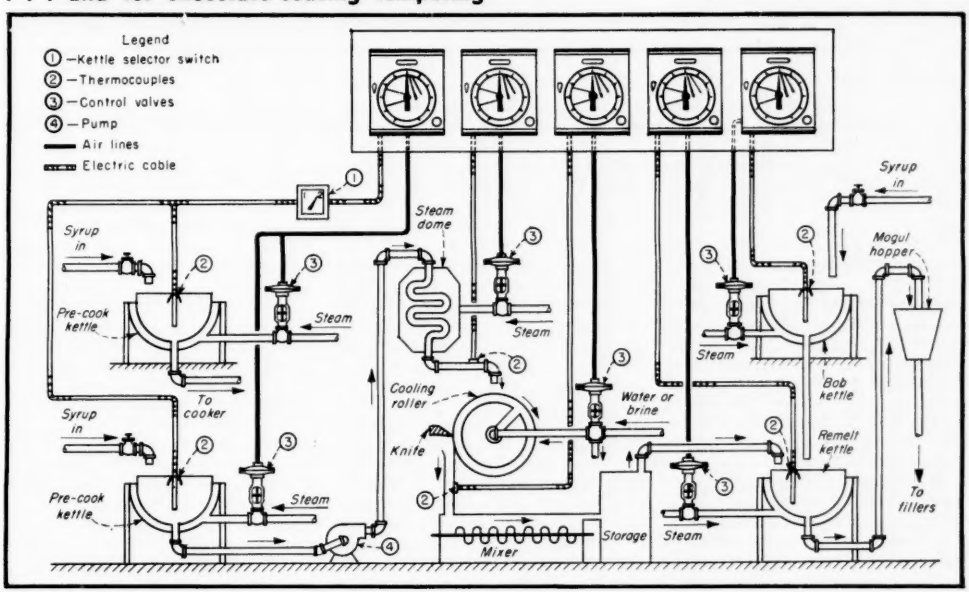
For a number of years, complex industrial processes have made use of such a device—the "Time-Pattern" transmitter—which is capable of automatically resetting the index of a control instrument so that it follows a predetermined temperature curve. With this unit, a curve is drawn on a circular chart to represent the exact time-temperature cycle that is to be reproduced. A metal cam, cut to this pattern, is rotated by the clockwork mechanism of the transmitting instrument. At the same time, a follower, resting on the periphery, pneumatically positions the index of the controlled instrument so that it, too, follows the shape of the cam.

This second instrument then performs four functions: First, it measures the temperature of the chocolate being tempered. Second, it compares this temperature with the desired value imposed by the Time-Pattern transmitter. Third, it operates hot water and cold water valves to add or remove heat, thereby adjusting the kettle temperature to this optimum value. Fourth, it furnishes a complete record of chocolate temperature throughout the tempering cycle, doubly insuring the chocolate maker against production errors.

Adapting Controls to Equipment

One problem that arises in controlling both the melter and the tempering kettle is the location of the thermocouple element to give satisfactory control. It would seem logical—since the temperature of the chocolate is controlled by adjusting the temperature of the water in the jacket—to locate the

. . . and for chocolate-coating tempering



element in the chocolate itself. In the case of the tempering kettle, this is often done.

However, this location means that there will be an unavoidable time lag between a change in jacket temperature and the resultant change in chocolate temperature. The anticipated lag is compensated by setting up the time schedule so that (although the chocolate temperature at any instant may not correspond exactly to the temperature called for by the controller) the final time-temperature treatment of the chocolate corresponds closely to the desired pattern.

In the melter, a similar control system is used. But it is impossible to locate the element in the chocolate because of mechanical difficulties. Therefore, the thermocouple is mounted in the water jacket instead. Here, the effect is the reverse of that encountered in the tempering kettle—the chocolate being melted has not yet reached the indicated temperature. But again, this factor is compensated by the design and shape of the cam so that the desired result is obtained. Some tempering kettles are also controlled on the basis of water temperature—and with excellent results.

Integrated Control

Automatic instrument control of this basic operation has worked so well that many of the larger candy manufacturers have embarked on ambitious programs to bring the benefits of instrumentation to all of their processes. Instrumentation has proven necessary because all "weak links" must be eliminated from the processing chain in order to reap full benefits of accurate process control.

Manufacture of enrobed or chocolate-coated candies serves as an excellent example of this principle. It was soon found that automatic tempering would be consistently successful only if the blended chocolate delivered to the tempering kettle is thoroughly conditioned and held at a constant temperature.

It can easily be seen why this is true, since the automatic tempering cycle is based on the assumption that completely melted chocolate must be delivered to the kettle. Therefore, as a necessary adjunct to the tempering controls, similar devices were installed on the chocolate melters. Control instruments for the melters are often located in the raw chocolate storage room. Thus, the appropriate cam to represent a given blend of chocolate can be set on the Time-Pattern transmitter before the raw chocolate is fed into the block-breakers for delivery to the melters.

A further example of the difficulties involved in perfecting complete process control is the problem often encountered in controlling tempering kettles and enrobers by varying the temperature of jacket water. An erroneous notion persists in some quarters that the addition of a quantity of hot water to a quantity of cold water produces warm water. Unfortunately, a vital factor—*thorough agitation and mixing*—is too often omitted.

Thus, when a controller calls for temperature increase in several degrees, a "slug" of hot water or steam is introduced into the jacket, causing an overheating of a small portion of the jacket, while the larger portion of the jacket remains at too low a temperature. For this reason, additional mixing chambers for the water supplied to heating jackets are included in many control systems.

Over-All Application

Although great improvements in candy-making methods are achieved through *unit process control*, complete success cannot be attained without going a step further and providing *over-all process control*. This implies controlling all conditions that may influence the quality of candy between the separate processes.

For instance, application of the devices mentioned above has brought about a control of the melting, tempering, and enrobing operations. Also, these devices might, at a hasty glance, seem to promise virtual elimination of fat bloom in chocolate-coated candies. However, experience proves otherwise, since it is well known that a significant variation in chocolate temperature may be encountered while the product is being piped from the melter to the tempering kettle, or from the tempering kettle to the enrober.

It is also known that if the centers are too cold at the time of enrobing, or if the enrobed candy is subject to too moist an atmosphere, serious defects will occur. Therefore, little is achieved by completely eliminating fat bloom if a similar phenomenon, caused by excessive moisture, is permitted.

Most plants have already solved the problem of temperature drops in pipelines, either by dielectric heating or other suitable methods. Many plants have adopted air conditioning systems to enable control of work-room temperatures and humidity throughout the plant.

Check on Air Conditioning

One of the best examples of over-all control is at the Loft Candy Co.'s plant in Long Island City, N. Y. Management at this progress-minded company has been able to produce chocolates of the highest quality by: (1) Providing a complete air conditioning system throughout all critical stages of candy making, (2) installing a temperature-and-humidity recording system to check on the most important of these processing rooms, and (3) setting up a unique alarm system for extra protection.

Two multi-point recording instruments are used to check on the all-important temperature and humidity in the enrobing rooms, cooling tunnels, and packing rooms. Close supervision is vital in these areas.

Loft records indicate that the non-indicating air conditioning controllers are functioning correctly or providing prompt warning when attention is needed. Since the recording instruments are located where they will be under the constant supervision of the plant engineer, prompt action in the event of deviations is assured.

Standard resistance-thermometer elements connected to one of the multi-point instruments measure the temperatures in these rooms, and special humidity-sensing elements produce an electrical impulse that is recorded directly as relative humidity.

An auxiliary alarm system is set to sound a warning whenever the humidity in the cooling tunnels goes above a safe level, since this condition, if continued for any length of time, is a sure cause of chocolate bloom at a later date. The element located in the room is a humidity controller, similar to those found in many homes. It is connected to an alarm panel located in a well-traveled corridor of the plant.

So long as the moisture content of the air in the tunnels remains below that set on the controller, two green lights on the panel remain lighted to indicate that the system is functioning properly. Should the humidity increase above this set value, the green lights go out and two red bulbs flash on, while an alarm bell, wired in series with the lights, rings to attract attention.

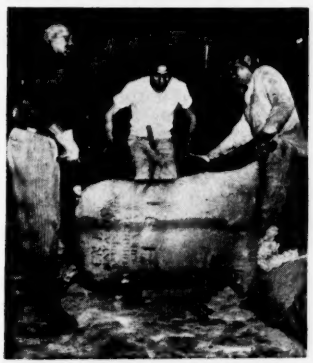
"Before, Between, and After"

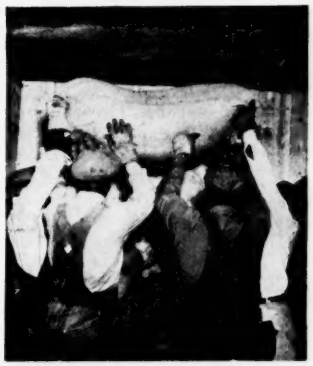
These various instruments and devices are of great value to management in giving assurance that high quality ingredients and the careful control of unit processes are not lost through failure to maintain necessary conditions before, between, and after these operations.

However, the applications listed here represent only a small part of the entire picture of candy-making process control. And even the complete picture, as it exists today, gives only a preview in a growing revolution in candy-making technics.

Plans are now being made to utilize control instruments in the solution of remaining processing problems. These instruments will provide automatic integration of unit operations, thus aiding the candy industry to produce better tasting, higher quality, and less expensive confections.

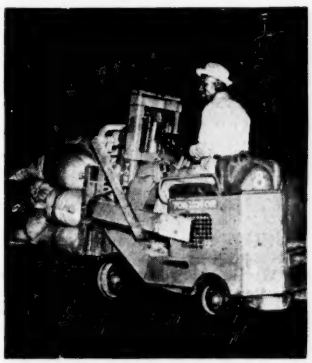
"Out" Went This Hard Way





Three men hook-load one bag . . . it's pushed into car . . . takes four men to stack

"In" Came This Easy Way



Now one man fork-trucks six bags . . . easily scoots them into car . . . stacks them in a jiffy

Down Go Bagged-Food Handling Costs

PROBLEM: Manual loading was an "expensive handicap" at this Texas sugar refinery

SOLUTION: Special fork trucks—that do it quicker, cheaper, safer

ADOPTION of a fleet of fork lift trucks —each truck equipped with a mechanical loading accessory—has enabled the Imperial Sugar Co., Sugarland, Tex. to overcome a difficult—but necessary—extra-handling situation.

Loading operations have now been stepped up 150 percent, while costs have been considerably reduced. At the same time, much of the tiring, dangerous manual work has been eliminated—bringing a 90 percent slash in employee accidents.

Here's the problem that confronted the company, one of the nation's large cane sugar refiners: Boatloads of sugar arrived at Galveston, Tex., and were unloaded to be reshipped to the refinery, 55 miles inland. Since it was not always practical to forward an entire shipload to the plant at one time, certain portions of each incoming load had to be temporarily stored in a dock-side warehouse.

This arrangement entailed additional handling, which proved to be a rather costly competitive handicap. Transportation and handling costs are big factors in the price of sugar. And competition is presently at an all time high.

Naturally, relocation of the plant was impossible. So, some method of improving the efficiency of these handling operations was quite necessary.

How It Was Done

Sugar is received in bags weighing 330 lb. each. Formerly two helpers were needed to load one bag onto a hand truck. Then one man pushed the load into a freight car, where four men joined together in placing the bag into position.

This manual handling of such bulky

loads was slow, tedious and expensive. And the use of bale hooks frequently resulted in damage.

So, the firm sought handling equipment capable of lifting, transporting and stacking the heavy loads. In addition, some means of unloading the bagged sugar in railway freight cars was needed. Solution: Lift trucks.

Today, one man operating a fork truck can handle a six-bag load of sugar weighing about 1 ton. Such loads are transported directly into the freight cars, and by means of the unloader are quickly positioned for shipment.

Loads marked for storage in the dockside warehouse are moved easily and safely and are stacked nine bags high by one man. Prior to advent of the trucks, manual handling in storage operations limited stacking to three to five bags. Thus, storage capacity has been increased at least 50 percent.

With this mass handling procedure, the firm can now load as many as 35-40 carloads per day—compared to 16 cars loaded manually. This permits faster shipment of the raw sugar to the refinery and provides a more equal competitive standing in the industry.

In all, not only employee safety and morale have benefited, but also the company's books.

27 Articles Which Tell How To Cut Costs

Published in "Food Industries" this year, these articles describe methods for reducing processing and distribution costs and for increasing productivity. We list them here for handy reference.—The Editors

JANUARY

1. Advanced Methods Bring Top Efficiency in Huge Cannery—Hawaiian Pineapple Co. can handle nearly 5 tons of fruit per minute. A story of progressive engineering and materials handling.

2. New Baked-Goods Shipping Cabinets Speed Deliveries and "Double" as Display Shelves in Stores—Quicker packing and shipping with new cabinets save labor and minimize returned goods.

FEBRUARY

3. New Practices "Up" Output of Prepared Food Mixes—Production of quality candy and dessert mixes expanded by installing continuous lines, adopting automatic methods of handling bulk raw materials and improving formulas.

4. Trucks Loaded 50 Cases At a Time—With pallet truck bodies served by forklifts, bottlers save man-hours and cut distribution costs.

5. Ice Cream-Stick Output Tripled—Labor, Coating Saved—Using a new continuous process, General Ice Cream Corp. is producing three times as many stick novelties with less than 50 percent increase in labor.

MARCH

6. High Efficiency Attained on Multi-Product Line—Continuous processing in Durkee plant speeds manufacture of salad dressing. Same line can handle mayonnaise and sandwich spread and easily double capacity.

7. Bottler Solves Vertical-Plant Problems—Canadian brewery solves problem of how to increase production in a narrow multi-floor bottling plant. Efficient layout and handling do the trick.

8. Candy Progress—Advanced methods and equipment increase productivity, cut costs and improve quality of confectionery.

APRIL

9. Seasonal Industry Profits From Production Engineering—Skillful engineering planning in a cannery increases output 7.55 percent, boosts earnings 15.5 percent and cuts unit cost 2.2 percent.

10. Noodle Progress—With continuous processing equipment, U. S. noodle production has been increased over 50 percent. Equipment has other applications.

11. New Bottling Line Reduces Breakage, Cuts Costs—Completely conveyorized bottle line in apple juice plant reduces labor costs over 50 percent, practically eliminates breakage, cuts floor space in half and ups output.

MAY

12. Industrial Engineering Cuts Labor, Time, Handling — How motion-time studies increase productivity per man hour and eliminate waste.

13. Modernization Ups Food-Plant Output to 155 Percent—A dairy plant modernizes to meet new distribution demands, increase production and lower operating costs.

14. Package Development and Package Check-List—A guide for developing a good consumer package, showing how to minimize costs consistent with the many modern requirements.

15. Safety Training Saves Company $1,000,000 Yearly—General Foods shows how 3-year safety-training program produces a 65 percent drop in accidents. Savings include $2,215,000 through cheaper insurance, lower indirect costs.

JUNE

16. This Quick-Pasteurizing System Cuts Mix Costs—Modern ice cream plant makes ice cream mix in 90 seconds. Both quality and economy are high.

17. Highway Food Haulage Takes a Spurt—Because of lower rates and faster deliveries, more trucks now are used to transport food. Savings of 10 to 25 percent reported.

18. Jam and Jelly Making—Improved quality, increased yields, lower costs and greater production result from modernized equipment and advanced operating methods.

JULY

19. Simplify Your Plant Tasks the Symbol Way—Using operation charts to analyze plant jobs improves methods, saves time, cuts labor costs and speeds production.

20. Get Your Shipping Costs Down With Return Loads—Employing trucks and a shuttle trailer set-up for inbound and outbound shipments, food company cuts freight costs 50 percent.

21. Dairy Industry Developments — Dairy plant saves time and labor and reduces marketing costs as result of new drop-shipment delivery system.

AUGUST

22. Wet Milling Advances a Century in a Decade—New plant triples production in processing sorghum grains, improves operations and minimizes maintenance costs.

23. Continuous Lines Multiply Output of Twisted Pretzels—Automatic machinery ups production 157 percent and cuts operating costs and labor.

24. Dairy Progress Today — Modern dairy plant balances output to obtain high per-gallon return; also increases sales two-fold and improves product quality.

SEPTEMBER

25. Bakery Progress—Recent advances take bakeries from the "push-rack" to the pushbutton class. In design, machinery, equipment and progressive technics, they are doing a better job.

26. Packaging and Quick Freezing of Fillets—The Gloucester General Seafoods plant has flexible, efficient lines to fillet, freeze and package fishery products. Picture-Flowsheet tells story.

27. Poultry Processing Speeded on Mechanized Line—Modern equipment, unique building layout and automatic conveyorizing achieve a production high of 1,000 chickens per hour in new Grimes & Hauer plant.

Industry Regains Stride

With signs pointing to a completion of postwar adjustments, food manufacturing holds forth a bright future to processors "who will really work to make it so."

PAUL S. WILLIS
President, Grocery Manufacturers of America, New York City.

Current economic conditions seem to indicate that the postwar adjustments of the nation's economy have pretty well run their course and that a leveling-off is taking place.

In August, forecasters pointed to the fact that while industrial production had dropped 17 percent below last year's peak, retail sales had dropped only 4 percent below the December, 1948, high and were less than 2 percent below the 1948 average. Consumption had been outrunning production for four to five months, and the decline in physical inventories of consumer goods against the persistently high rate of retail sales, indicated to observers that output must turn up shortly.

Renewed confidence and a revival of trade buying were noticeable in the business picture, serving to bolster economic predictions of an upturn.

Therefore, barring unforeseen developments, the future appears hopeful. The economy is seemingly better balanced than it has been for some time and the food situation is good. Food and grocery sales volume is expected to continue at a fairly high level, with a plentiful supply of goods on the market and a plentiful supply of buyers with good incomes.

Manufacturers' sales of food and grocery products so far in 1949 have pretty well held at 1948 levels. And in the face of the predicted general upturn in business this fall, manufacturers are confident that the pace can be maintained. A recent survey of GMA members shows that in the first half of this year 67 out of the 102 companies reporting had tonnage sales equal to, or better than, those in the same period of 1948. Furthermore, many of the companies that reported decreased volume stated that they expected a second-half improvement.

Retail food store sales for the first five months of 1949 totaled $12,800,000,000, as compared to $12,900,000,000 in the same period of last year. While the trade experienced the usual summer slump, it expects that sales figures for the year will, at least, equal the $32,000,000,000 figure made in '48.

These figures, plus government statistics on employment and consumer income, show the economy is healthy.

The food industry's ability to maintain sales volume during the transition period can be attributed largely to the aggressive merchandising and advertising efforts put forth by its members. Manufacturers were quick to recognize that the return of the buyer's market placed full emphasis upon selling techniques. And, recognizing this, they stepped-up their advertising and merchandising campaigns accordingly. Instead of bemoaning the fact that it was now harder to make a sale, they *worked harder* to make it, and current sales figures prove this policy wise.

Fortunately, there has been an increased appreciation by the American people of the value of eating good, nutritious foods. Per capita consumption in 1948 was 1,600 lb., compared to the 1,475-lb. average of 1935-39.

Food Prices Examined

The continued high level of grocery sales can also be credited to the fact that most food products are recognized by the people as being good buys in the market place today. National brands of these products are now selling at low prices in relation to manufacturing costs. And prices of perishable items which had risen most after the war, have substantially dropped.

Food prices apparently reached their postwar peak in the summer of 1948. The Dun & Bradstreet wholesale food price index hit a high of $7.36 on July 13, 1948, and then moved steadily downward to $5.66 on July 5, 1949. A slight upturn then took place, and the index stood at $5.86 on August 24. While the trend of retail food prices is still difficult to forecast, no great change seems likely in coming months.

THE AUTHOR gives ample reasons for his optimistic outlook.

Purchasing Power High

The ability of consumers to continue their purchases of quality foods in large quantities is proved by statistics, which show that "real" purchasing power, after correction for both taxes and prices, was 62 percent higher in the first quarter of 1949 than it was in 1939, and 6 percent higher than in the first quarter of 1948.

Disposable income (income after taxes) was $195,000,000,000 in the first quarter of 1949 and $194,000,000,000 for the second quarter. Last year, disposable income was $182,000,000,000 in the first quarter and $190,000,000,000 for the year.

Civilian employment figures also support the optimistic sales outlook. There was actually only a 3 percent decline in employment from July, 1948, to July, 1949—from 61,615,000 last year to 59,720,000 this year.

In general, people have the money with which to satisfy their household needs—including ample quantities of food products—and they will spend that money if they are properly "sold."

The American people are now more food-minded than ever before and appreciate the importance of eating good foods. To hold them in this position, we must do those things that will continually excite their interests, such as offering new foods, new packages, new uses for products, new recipes, using attractive advertising, and the like.

While the progress we have made gives us a good foundation upon which to build the food industry to greater and greater heights, we must recognize that competitive conditions require each of us to do a better job.

The future is bright—but only for those who will really work to make it so.

Graphs Show How Hydrogen Ion Concentration Changes With Acid Content

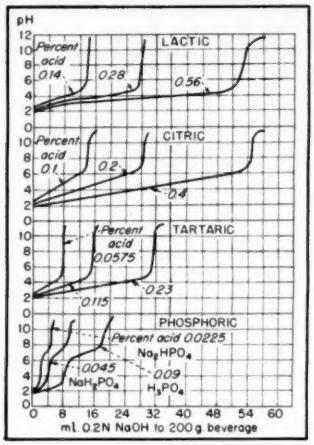


FIG. 1. Titration curves show sudden changes in pH at critical acid content.

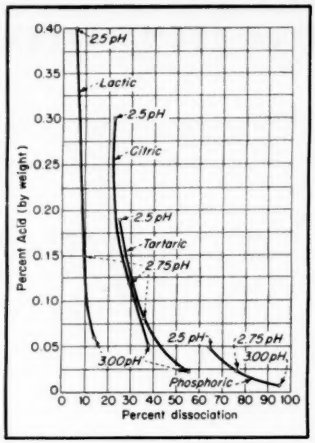


FIG. 2. Acid strengths are determined by hydrogen ion dissociation.

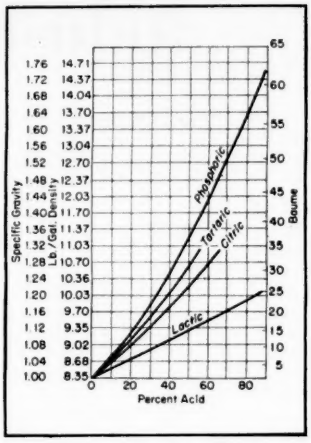


FIG. 3. Density of acid solutions increases with acid concentration.

Acids Play Important Roles In Flavor

But taste and pH in beverages should not be relied upon as sole indicators of their concentration. Curves show why these tests fail to detect high acid

M. SIVETZ

Chemist-Engineer, Argonne National Laboratory, Chicago, Ill.

Excessive concentrations of food-grade acids in syrups and beverages can be a source of unsuspected "off-flavors." Consequently, the relationship of pH and percent acid to flavor must be clearly understood.

This was forcefully brought to the attention of a central franchise bottler's laboratory last fall. Numerous complaints were received regarding a particularly large lot of "bad" beverage. Although investigating such complaints is a routine occurrence, the solution to this problem revealed a fundamental weakness in existing ideas regarding soft drink tasting and pH analysis. This problem stimulated experimental work—results of which are presented here—on the significance of pH as related to percent acid and hydrogen ion dissociation as it affects bottler's syrup, competitive manufacturing qualities and costs.

Syrup Had Excess Acid

The aforementioned "off-flavor" was due to a syrup mixing mistake wherein twice the proper amount of acid was used. This error was not reported, nor was it detected by the chemist in charge of the particular syrup plant, although routine acid analysis would have immediately indicated the trouble.

The "complaint samples" had a peculiar taste, but were not noticeably sour. Because their pH was almost normal, and because another source of "off-flavor" was suspected, excess acid was not even considered. Not until the pH-NaOH titer curves (Fig. 1) and the "unknown" were plotted was the truth revealed.

Why Taste Is Unreliable

Significance of pH and taste as related to percent acid may be seen by reference to the curves in Fig. 1. These show that it takes many multiples of acid to cause an appreciable change in pH, and in taste. This is true because:

a. pH increases arithmetically with an exponential rise in hydrogen ion concentration.

b. The percent dissociation of hydrogen ions from the acid molecule decreases as the concentration of acid hydrogen increases. This is not of as great magnitude as (a).

c. The relative strength of an acid is determined primarily by its percent hydrogen ion dissociation.

The strongest acids dissociate most. The greater the number of hydrogen ions formed, the lower the pH and the greater the density of the acid solution at a given concentration. This is shown in Figs. 2 and 3 for the four acids commonly used in beverages. Buffering salts, such as sodium citrate in a citric acid solution, lower acid dissociation. Therefore, they prevent exertion of the full taste of sourness, or lowest pH, for a given concentration. This is what occurs in natural fruits and juices. Excessive acid concentrations also are deleterious to natural oil flavors.

Percent acid as related to pH is best understood by the following definition: pH = −log (hydrogen ion concentration in moles per l.) = −log (H). But since the number of active hydrogen ions differs from the moles of acid per l. of solution, pH = −log (activity of hydrogen ion concentration) = −log (a_H). For example:

pH = −log (1/100) = 2.

pH = −log (1/1,000) = 3.

where pH values 1 to 7 are acid, 7 is neutral, and 7 to 14 are alkaline.

Values for pH less than one or greater than 14 are not usually considered. This is because pH deals with small hydrogen ion concentrations,

e.g. pH = 0 would be equivalent to a one molar hydrogen ion concentration.

Why Acids Are Used

Of the several acids used in soft drinks, choice of the proper one is usually governed by its ability to bring out the flavor of the particular beverage. For example, citric acid generally is used in ginger ales, most fruit flavors and cream soda; phosphoric acid for colas, sarsaparilla and root beer; tartaric for grape, and malic for apple, cherry and celery.

In Table I are listed the characteristics of natural and carbonated beverages.

Where several acids are equally satisfactory, as in cola drinks, economics plays an important part in the selection of the one used. Because of its lower cost per pound and greater strength, the mineral acid, phosphoric, is the one accepted for colas.

In addition to their primary purpose—balancing flavor and sweetness—acids play these important secondary roles in soft drinks: (1) They retard and kill bacteria. (2) Catalyze sucrose inversion, causing a gradual increase in body and sweetness. (3) When sodium benzoate is present, acids convert it to benzoic acid, a very effective microorganism killer.

How To Evaluate Acid Strengths

In cases where one acid can be substituted for another, it is of economic importance to know how the strengths of the two acids compare. Chemical equivalent weights will not yield the same degree of sourness, because sourness is a measure of effective acidity, or hydrogen ion concentration. The higher the percent of dissociation, the stronger the acid.

Table II illustrates the significance of percent hydrogen ion dissociation. This can be evaluated experimentally from electrical conductivity measurements, or by pH measurements of solutions of known acid content.

Table III shows relative strengths of the four acids commonly used in soft drinks, their cost per pound, and the cost per unit of active acid strength.

How Beverage Acidity Is Determined

To determine the acid content of a beverage, the following steps are taken: (1) Pour beverage back and forth in beakers until most of the CO_2 is removed. (2) Measure 10 ml. into a 125-ml. flask and boil to expel remaining CO_2. (3) Add 3 drops of phenolphthalein and titrate with 0.02N NaOH to a pink color. Then use the formula

$$\frac{\text{ml. NaOH} \times \text{N}}{1{,}000} \times \frac{\text{eq. wt.} \times 100}{\text{Sample weight}} = \text{percent acid.}$$

For example, a 10-ml. sample of carbonated beverage acidified with citric acid required 8-ml. of 0.02N NaOH to produce a pink color. Therefore,

$$\frac{8 \times 0.02 \times 70 \times 100}{1{,}000 \times 10} =$$

0.112 percent citric acid in the beverage.

Characteristics and Methods of Manufacture

Characteristics of the acids normally used in soft drinks are:

Lactic Acid is a colorless syrupy solution. It is manufactured from milk sugar by the enzyme zymase, then precipitated with lime and released with H_2SO_4. Although difficult to obtain pure, it can be purified by vacuum distillation.

Citric Acid is an odorless crystalline anhydride, or hydrate, that is manufactured from sucrose by means of the mold *Aspergillis niger*. It is also recovered from the juices of off-grade citrus fruits by clarification and precipitation as a calcium salt. Sulphuric acid releases the citric acid with the precipitation of calcium sulphate. The solution is then concentrated and crystallized.

Malic Acid, M. W. 134, occurs in apples and pineapples and in unripe grapes, cherries and rhubarb stalks. The crystal also is produced synthetically by the action of H_2SO_4 on maleic acid.

Tartaric Acid crystals are produced from the white cake formed on grape wine casks. The crude cream of tartar is converted to calcium tartrate, then, by the addition of H_2SO_4, to tartaric acid and calcium sulphate.

Phosphoric Acid is a colorless, odorless, syrupy solution which is extremely corrosive. It is produced by the action of elemental phosphorus vapor on the moisture in air. Phosphoric acid beverages exhibit pH values below 2.5, whereas organic acid beverages do not.

Beverages Need Different Acids To Boost Flavors

TABLE I—CHARACTERISTICS* of Natural Drinks and Carbonated Beverages

	Carbonated Beverages				Natural Juices			
Flavor	Sugar Percent	pH	Acid Percent	Gas Volumes	Sugar Percent	pH	Acid Percent	Acid Used
Apple	14	3.5	0.10	3.0–3.5	11	3.3	0.5	Malic
Celery	10	5.7	0.02	2.5–3.0	1	5.7	0.2	Malic
Cherry	12	3.0	0.10	3.0–3.5	13	3.2	0.2	Malic
Grape	14	3.0	0.10	2.0–2.5	20	3.0	0.9	Tartaric
Grapefruit	12	3.0	0.18	3.0–3.5	8	3.2	1.5	Citric
Lemon	11	2.7	0.13	3.5–4.0	6	2.2	6.0	Citric
Lime	11	2.6	0.14	3.5–4.0	3	2.0	7.0	Citric
Orange	14	3.5	0.08	2.0–2.5	10	3.3	1.2	Citric
Pineapple	12	3.3	0.12	2.5–3.0	11	3.2	0.9	Citric
Raspberry	12	3.0	0.10	3.0–3.5	8	3.6	1.5	Citric
Strawberry	12	3.0	0.10	3.0–3.5	6	3.3	0.9	Citric
Sarsaparilla	10	4.5	0.01	3.0–3.5	—	—	—	Phosphoric
Root beer	13	5.0	0.01	3.0–3.5	—	—	—	Phosphoric
Colas	10	2.3	0.05	3.5–4.0	—	—	—	Phosphoric
Ginger ale—Golden	10	2.8	0.12	3.0–3.5	—	—	—	Citric
Ginger ale—Pale dry	8	2.6	0.24	3.5–4.0	—	—	—	Citric
Cream (vanilla)	13	5.5	0.02	3.0–3.5	—	—	—	Citric
Sparkling water	—	4.5	—	3.5–4.0	250–1,000 ppm. TDS			Mildly saline
Club soda	—	5.5	—	3.5–4.0	1,000–2,000 ppm. TDS			Mildly saline
Lithiated water	—	4.5	—	3.5–4.0	800–1,000 ppm. TDS			Moderately saline
Vichy	—	5.0	—	3.5–4.0	2,000–3,000 ppm. TDS			Very saline
Distilled water	—	3.5	—	3.5				

* Values will vary slightly with different bottlers' formulae and with variation in ripeness and natura environment of fruits.

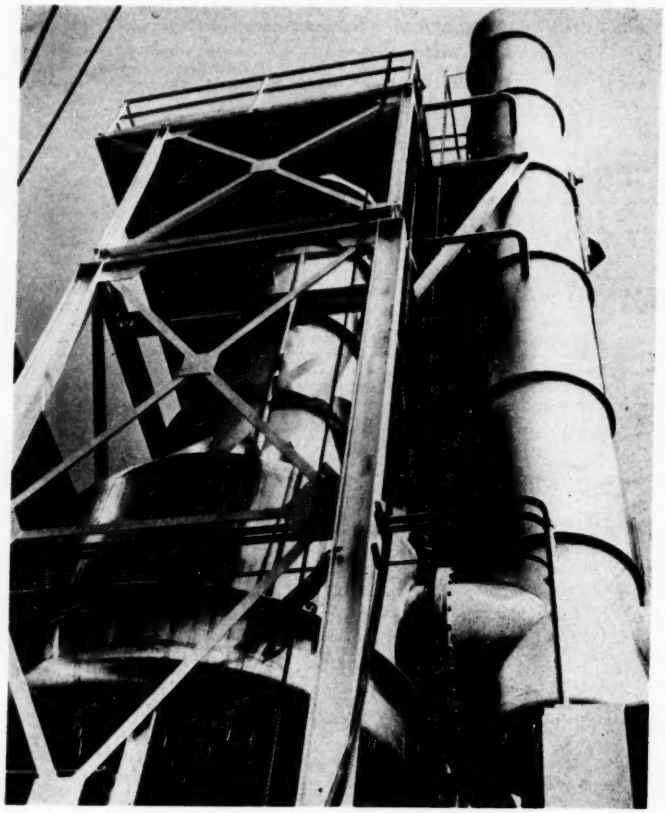
TABLE II—HYDROGEN ION DISSOCIATION Indicates Acid Strength

Acids	Formula	Approx. Percent Dissociation	Ionization Constant K	pH 0.02N Acid At 25°C.	pH 10 Percent Sucrose Solution
Phosphoric	H_3PO_4	70	1.1×10^{-2}	2.45	
Tartaric	$H_2C_4H_4O_6$	30	1.1×10^{-3}	2.58	
Malic	$H_2C_4H_4O_5$	—	4.0×10^{-4}	—	
Citric	$H_3C_6H_8O_7$	28	8.0×10^{-4}	2.68	
Lactic	$HC_3H_5O_3$	9	1.6×10^{-4}	2.73	

TABLE III—FOOD ACIDS Vary In Strength and Cost

Acids	Weights Molecular	Weights Equivalent	Relative Strengths	Cost per Lb.	Cost per Lb. R. S.
Lactic	90	90	100	20c	20c
Citric	210	70	125	28c	22c
Tartaric	150	75	200	38c	19c
Phosphoric	98	49	650	17c	2.5c

Skyward close-up reveals details of lofty evaporator



SEEN is concentrator's third-effect evaporator leg. Juice and vapors are separated in big centrifugal chamber (foreground).

New Low-Temp Evaporator Doubles Plant Production

Operating on continuous basis, high-vac unit ups output from 100 to 218 gallons of citrus juice per hour

E. J. KELLY
Chief Engineer,
C. E. Howard Corp., South Gate, Calif.

Utilizing a continuous and automatically controlled flow principle, a new type, high-vacuum, low-temperature concentrator has recently been installed at the Real Gold Citrus Products Co. plant, Anaheim, Calif. The new unit increases plant capacity, reduces costs per unit, and produces an end-product having improved qualities.

The plant's previous concentrating equipment had a capacity of 100 gal., per hr. Operated on the batch principle, it required temperatures up to 120 deg. F. for proper evaporation. Such high temperatures altered the flavor of the juice.

Constructed by the C. E. Howard Corp. of Los Angeles, the new equipment increases the plant's capacity to 218 gal. per hr. And it is figured that it decreases cost of production to one-fifth of the previous figure.

Flexibility of this evaporator will enable the company to produce several new products. Among those planned are a quick-frozen 3-to-1 pure orange juice concentrate. Another new product under consideration is a 3-to-1 orange concentrate with sugar added. Both of these new products will be offered to consumers in 6 oz. cans.

Here are data computed on the low cost operation. Including electrical power at 1c. per kw.-hr., and steam at 60c. per 1,000 lb. per hr., citrus juice can be concentrated on a 3-to-1 ratio at a total power cost of ¾c. per gal. Cost of evaporating orange juice from 13 deg. Brix to 60 deg., is approximately 1½c. per gal. On this low cost basis, it is estimated that the investment of about $250,000 in the equipment can be easily amortized within 5 years.

How It Operates

Basically, the concentrator accomplishes a triple effect evaporation. After extraction from the fruit, the product to be processed is pumped from holding tanks into the first effect at normal room temperature of 75 deg. F. The evaporator bodies are designed on the falling-film principle, wherein the product enters the top tube sheet and falls in a very thin film down the inside of properly sized tubes.

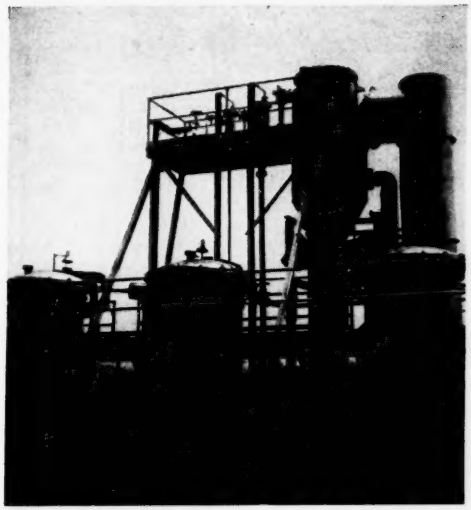
Latent heat of evaporation is given up to the product, causing ebullition through the film. This releases vapor, which proceeds down the tubes into a centrifugal type vapor separation chamber.

From this centrifugal entrainment separator, the vapor is transmitted, by pipe-line, to the second effect, where it becomes the heating medium. The partially concentrated product from the first effect is pumped from the juice pot, at the base of the separator body, to the tube sheet of the second effect, where the evaporation cycle is repeated. Vapor, released from the partially concentrated juice, moves from the second effect through a vapor pipe to become the heating medium for the third effect.

The product, now a more highly concentrated liquid, is pumped to the third effect, and the evaporation cycle is repeated. Upon leaving this final effect, the juice has reached its desired concentration stage and is pumped from the juice pot to the blender.

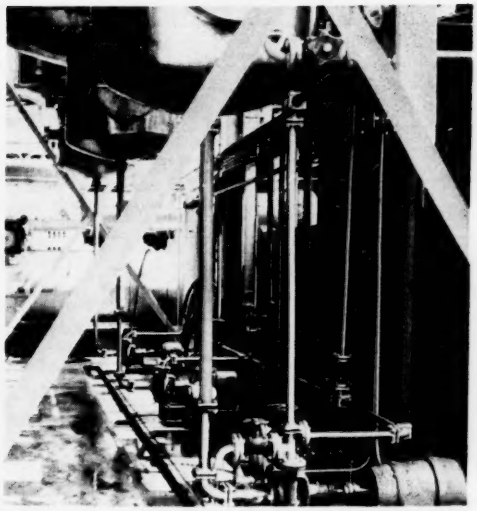
Because of the corrosiveness of acids in citrus products, all parts of the evaporator in contact with the product are fabricated of type 316 stainless steel.

Vapors are drawn off at top . . .



EFFECTS have counterbalanced hinged heads. Barometric condenser and jet pumps are at upper rear.

. . . and juice collected at bottom



PUMPS beneath effects move juice from pots (top) to next stage. Glass pipes permit visual inspection.

Vapor from the third effect moves through a pipe to a conventional type barometric condenser, in which cold water is circulated through a closed system. The cold water condenses the vapor, and the effluent drops through the barometric tail pipe into the cold well. Serving the barometric condenser is a conventional 3-stage steam jet vacuum pump.

Compressor Is Heart

Both the heat and cold employed are developed by a Carrier centrifugal compressor, the heart of the evaporator. This is a conventional type of unit used for air-conditioning large buildings. The compressor, driven by a 4,000v., 250-hp. synchronous motor, is entirely self-contained, requiring no external refrigerant lines. Freon-11, the refrigerant used, is non-toxic, non-inflammable, and non-explosive.

This unit provides 750 gpm. of 37 deg. F. water to the barometric condenser and 20 gpm. to the inter-condensers of the 3-stage steam jet vacuum pumps. Steam consumption of the vacuum pump is kept at a minimum through the use of this chilled water, which enters the condensers at 37 deg. F. and exits at 45.

Refrigerant vapors are condensed with 600 gpm. of 80 deg. F. water. In so doing, this water is heated to approximately 90 deg., then it is pumped to the first effect, where it becomes the heating medium for the evaporation in the tubes.

By providing the heat for evaporation, this water is cooled to 80 deg. F. and returned to the unit. There is, at this point, an uneven heat balance wherein the mechanical work of the compressor is reflected as heat and does not strike the balance of the system.

To correct this inequality, 150 gpm. of 90 deg. water is taken off the feed pipe and pumped to a small cooling tower. This same amount of water is returned to the hot water system at 80 deg. F. through the 20 hp. pump operating on the return pipe to the refrigeration unit.

In the description that follows, the reader will find the operations clarified by frequent reference to the flow diagram accompanying this article. To simplify the explanation, the respective units have been numbered from 1 to 7 in the diagram, and in the subsequent paragraphs these numbers, given in parentheses, serve as keys.

Heat transferred on the hot side of this unit (1) equals 3,077,000 Btu./hr. and on (2) the cold side, 3,750,000 Btu./hr. The compressor is equipped with a suction damper to provide for variable load operation.

Quantities Involved

There are 10,870 lb. of single strength fresh orange juice pumped per hour to the first effect. As previously stated, it enters at the top of the column and flows in a film down the tube bundle. Within the tube bundle, directional flow baffles are arranged to give a high heat transfer rate from the 90 deg. F. water heating medium. Vacuum within this effect is 29.125 in. Hg. Heat transferred by this unit (3) totals 3,000,000 Btu./hr.

Partially concentrated juice drops into the juice pot at the base of the column, and the vapor is taken from it in the centrifugal entrainment separator. This unit is comprised of a cylindrical baffle. To escape, vapor moves through an opening and thence around the periphery of the baffle and into the vapor pipe that leads to the second effect. This centrifugal separation is 99.9 percent effective.

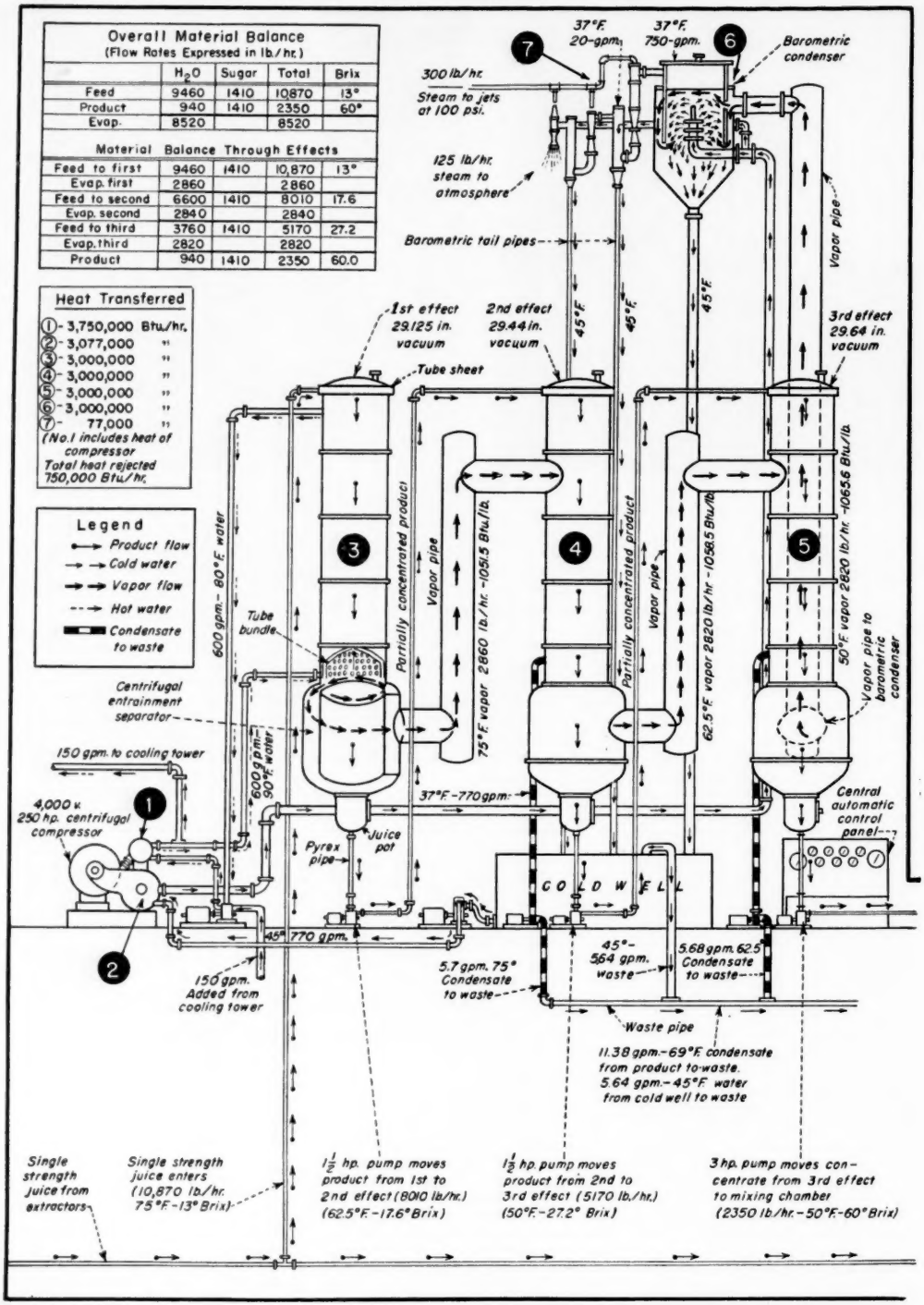
Entrainment of product is reduced to a nil amount. The only entrainment evidenced, in pilot plant operation, was of volatile liquids of esters, recoverable only through condensation. These appeared as condensate in the final condensation of the vapors. This type of centrifugal separator is used on all three of these effects.

Glass Piping Used

A 3 hp. juice pump moves 8,010 lb. of partially concentrated product from the first to the second effect. Temperature of this material has been reduced to 62.5 deg. F., and it is now 17.6 deg. Brix. The product is moved from each effect through a glass pipe connecting the effects with the pumps. This pipe and various sight glasses permit the operator to visually inspect the product flow.

Approximately 2,860 lb. of vapor per hour (1,051.5 Btu./lb.) at 75 deg. F., moves from the first effect through the vapor pipe to the second effect, where it becomes the heating medium. The process of evaporation is repeated in this second effect under 29.44 in. of vacuum, exactly as in the

Details of New Concentrator . . . And Canning Line It Feeds


Overall Material Balance
(Flow Rates Expressed in lb./hr.)
H2O | Sugar | Total | Brix
Feed 9460 1410 10870 13°
Product 940 1410 2350 60°
Evap. 8520 8520
Material Balance Through Effects
Feed to first 9460 1410 10,870 13°
Evap. first 2860 2860
Feed to second 6600 1410 8010 17.6
Evap. second 2840 2840
Feed to third 3760 1410 5170 27.2
Evap. third 2820 2820
Product 940 1410 2350 60.0
Heat Transferred
① - 3,750,000 Btu./hr.
② - 3,077,000 "
③ - 3,000,000 "
④ - 3,000,000 "
⑤ - 3,000,000 "
⑥ - 3,000,000 "
⑦ - 77,000 "
(No.1 includes heat of compressor
Total heat rejected 750,000 Btu./hr.
Legend
Product flow
Cold water
Vapor flow
Hot water
Condensate to waste
37°F. 20-gpm.
37°F. 750-gpm.
Barometric condenser
300 lb./hr. Steam to jets at 100 psi.
125 lb./hr. steam to atmosphere
Barometric tail pipes
Vapor pipe
45°F.
1st effect 29.125 in. vacuum
2nd effect 29.44 in. vacuum
3rd effect 29.64 in. vacuum
Tube sheet
600 gpm.-80°F. water
Tube bundle
Partially concentrated product
Vapor pipe
75°F. vapor 2860 lb./hr.-1051.5 Btu./lb.
62.5°F. vapor 2820 lb./hr.-1058.5 Btu./lb.
50°F. vapor 2620 lb./hr.-1065.6 Btu./lb.
Vapor pipe to barometric condenser
Centrifugal entrainment separator
150 gpm. to cooling tower
600 g.p.m.-90°F. water
4,000 v. 250 hp. centrifugal compressor
37°F.-770 gpm.
Central automatic control panel
Pyrex pipe
Juice pot
COLD WELL
45°-770 gpm.
150 gpm. Added from cooling tower
5.7 gpm. 75° Condensate to waste
45°-564 gpm. waste
5.68 gpm. 62.5 Condensate to waste
Waste pipe
11.38 gpm.-69°F. condensate from product to-waste.
5.64 gpm.-45°F. water from cold well to waste
Single strength juice from extractors
Single strength juice enters (10,870 lb./hr. 75°F.-13° Brix)
1½ hp. pump moves product from 1st to 2nd effect (8010 lb./hr.) (62.5°F.-17.6° Brix)
1½ hp. pump moves product from 2nd to 3rd effect (5170 lb./hr.) (50°F.-27.2° Brix)
3 hp. pump moves concentrate from 3rd effect to mixing chamber (2350 lb./hr.-50°F.-60° Brix)

first. Vapor condensing within the tube bundle is withdrawn at the rate of 5.7 gpm. (75 deg. F.) by a 1 hp. condensate pump, and it is then moved to the waste pipe. Heat transferred (4) by this unit is 3,000,000 Btu./hr.

A 3 hp. juice pump moves 5,170 lb. of the partially concentrated juice —now at 50 deg. F. and 27.2 deg. Brix—from the second effect to the third. Approximately 2,840 lb. of 62.5 deg. F. vapor (1,058.5 Btu./lb.) moves from the second effect entrainment separator through the vapor pipe to the third effect, to act as the final heating medium.

The process of evaporation is repeated in this final effect under 29.64 in. of vacuum. Vapor condensate is removed at the rate of 5.68 gpm. (62.5 deg. F.) and pumped to the waste pipe. Heat transferred by this unit (5) is 3,000,000 Btu./hr.

The product, which has now reached the desired concentration stage of 60 deg. Brix, has also increased in viscosity. It is recirculated and removed from this final effect by a 15 hp. pump, which moves 2,350 lb. of 60 deg. Brix concentrate, now at 50 deg. F., to the automatic blender.

Role of Recirculation

Approximately 2,850 lb. of 50 deg. F. vapor (1,065.6 Btu./lb.) moves from the separator through the vapor pipe to the barometric condenser. This is a conventional type of condenser in which 750 gpm. of 37 deg. F. water is sprayed into a chamber from sprinkler heads to provide intimate contact with the vapor to be condensed. Heat transferred by this unit (6) is 3,000,000 Btu./hr. The water leaves the barometric condenser at 45 deg. F. and falls through a tail pipe to the cold well. From this well it is recirculated through the refrigeration unit and returned to the barometric condenser.

The two inter-condensers serving the 3-stage steam vacuum pump utilize the remaining 20 gpm. of this 37 deg. F. water for condensation of motive steam of the jets. From the inter-condensers, this water falls through two tail pipes to the cold well and is recirculated through the system in a manner identical with the recirculation of the water used in the barometric condenser. Heat transferred by this unit (7) is 77,000 Btu./hr. Total heat rejected by the system is 750,000 Btu./hr.

There is no makeup required in this system. Actually, there is an overflow of 5.64 gpm. of 45 deg. F. water to waste, which represents the amount of condensed vapor that is produced in the third effect of the evaporator.

Retention time of the material in the three effects is approximately 45 to 50 sec. When the operation is stopped, the total plant has a backlog, or inventory of product, of approximately 3 min. flow. This is removed from the equipment by opening bypass valves and pumping the system free of the product which flows to the automatic blender. The product pumped from the three effects produces, when combined, a concentrate with average Brix of about 60 deg., and it is acceptable as a blending medium.

Blending Is Automatic

From the third effect, the concentrated juice is pumped to the automatic blender. Here, fresh, single strength juice is added to the concentrate, and the combined product is blended to a uniform 42 deg. Brix by flowing across the baffles in the blender. As it leaves the blender, it flows into the gravity measuring chamber, and the degree of Brix is automatically controlled by a manometer accurate to 1/10 deg.

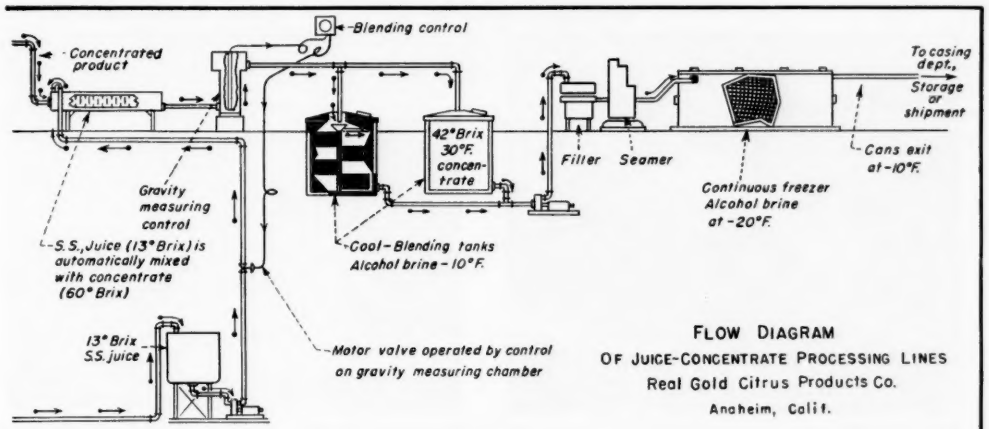
Utilizing nitrogen, this manometer measures the pressure exerted by the nitrogen through a tube to the bottom of the gravity measuring chamber. The resistance set up by the concentrate to the exit of this nitrogen determines the degree of Brix of the product. A deviation more than 1/10th of a degree Brix, will cause the instrument to automatically shut off the pump that supplies the blender unit with single strength juice—until there is proper adjustment.

Juice Is Quickly Cooled

From the gravity measuring chamber, the juice flows to the cooling and blending tanks. These stainless-steel jacketed tanks are refrigerated with a —10 deg. F. alcohol brine. The concentrate flows into a receiving pot and thence into a distribution trough. The latter revolves around the tank with the action of the agitator-scrapers. The concentrate, flowing from the exit of this trough, is deposited on the side walls of the tank and, as it flows down the walls, is quickly cooled to 30 deg. F. The agitator-scrapers combination keeps the walls free of any significant accumulation of concentrate.

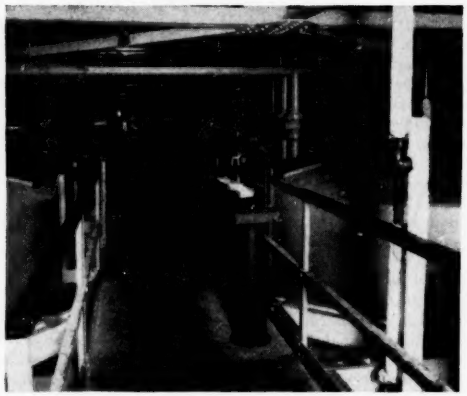
The finished concentrate is now pumped to the 6 oz. can fillers and seamers, and the canned product is then moved by conveyor to the continuous freezer. Utilizing the same principle as a conventional continuous cooker, the reel within the freezer picks up the cans and immerses them in an alcohol brine of —20 deg. F.

It requires 12 min. to freeze a can of this concentrate. The frozen product is then cased and put in low temperature storage ready for shipment.

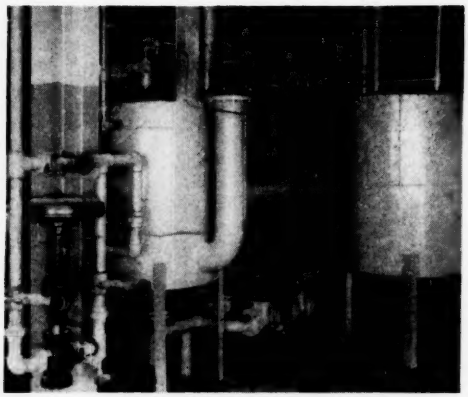

Blending control
Concentrated product
To casing dept., Storage or shipment
42° Brix 30° F. concentrate
Filler
Seamer
Cans exit at -10° F.
Gravity measuring control
Continuous freezer Alcohol brine at -20° F.
S.S. Juice (13° Brix) is automatically mixed with concentrate (60° Brix)
Cool-Blending tanks Alcohol brine - 10° F.
13° Brix S.S. juice
Motor valve operated by control on gravity measuring chamber

FLOW DIAGRAM
OF JUICE-CONCENTRATE PROCESSING LINES
Real Gold Citrus Products Co.
Anaheim, Calif.

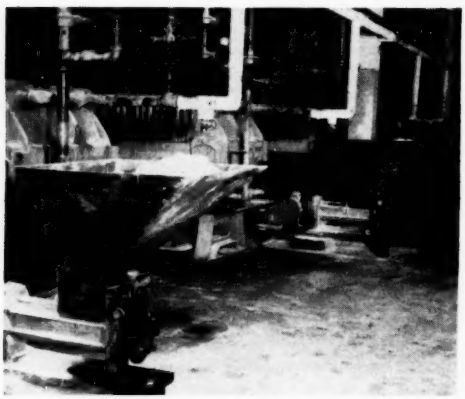
Bleaching steps traced by photos . . . numbered to key with points in diagram ⟶



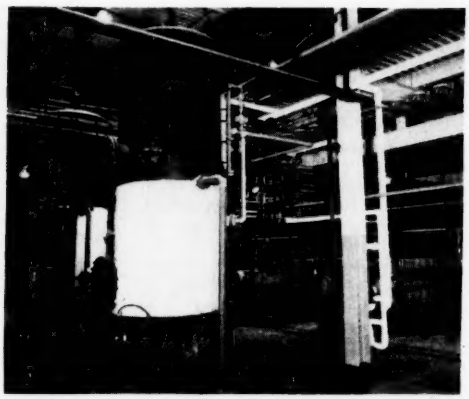
1,2 FOR WEIGHING and for supply 140,000-gal. tanks are used. Steam coils keep proper temperature.



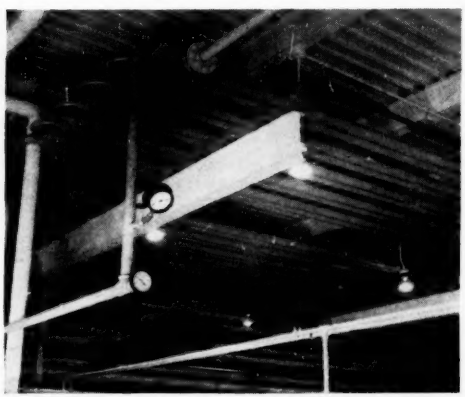
3 OIL is initially pumped into slurry tanks, where it is spray-mixed with adsorbent clay.



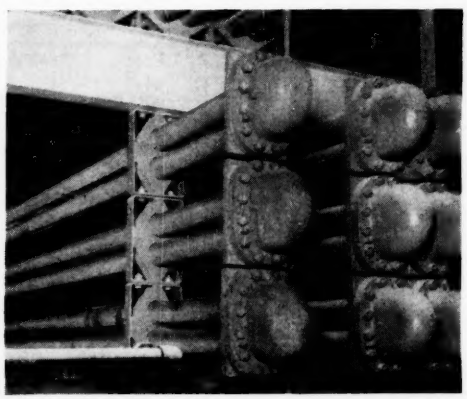
4 THIS HOPPER delivers clay into slurry. Rate is controlled by adjusting speed of screw-type feeder.



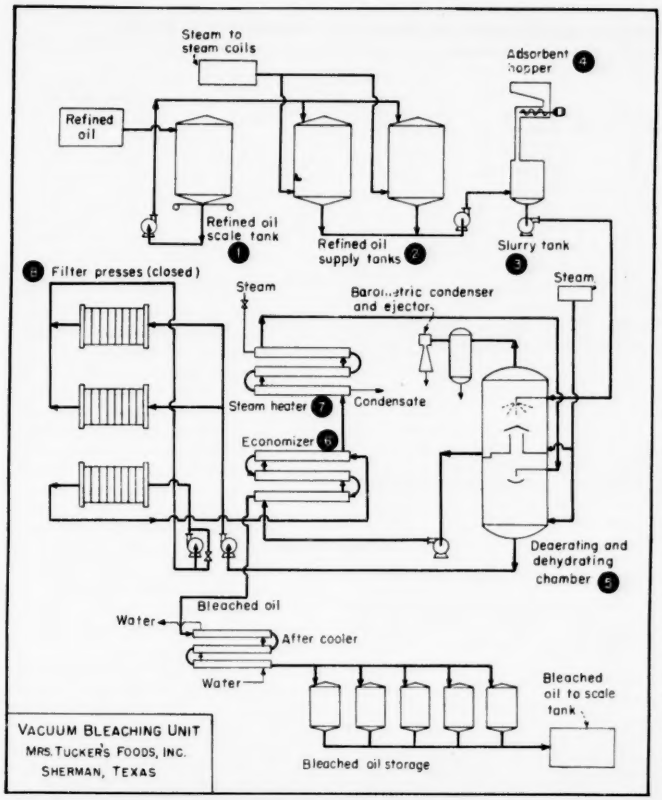
5 INTO upper part of this vacuum tower is sprayed mixture from slurry tanks, removing water and gases.

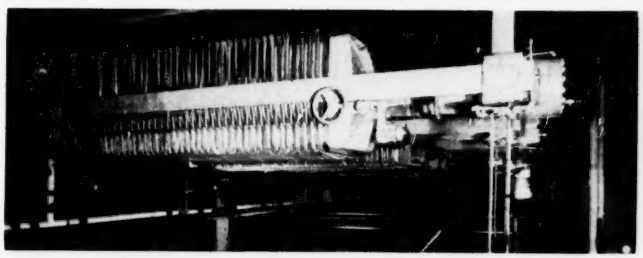


6 OIL-TO-OIL concentric heat exchangers, where the slurry absorbs heat from oil leaving filters.



7 STEAM-HEATERS bring the slurry up to 230 deg. for its return into lower half of vacuum tower.





8 FILTER PRESSES, of 36-in. aluminum plate, are connected in series. They remove clay from slurry drawn from bottom of lower chamber of tower.

Vacuum Bleaching of Oils Called "7 Ways Better"

Switch to this continuous system brings lighter, and more stable oils of lower soap content. Less adsorbent needed

H. V. HIGHTOWER
Editorial Representative, "Food Industries"

With the recent installation of two new continuous vacuum units for bleaching cottonseed and soybean oil, seven specific advantages are reported to be paying off for Mrs. Tucker's Foods, Inc., Sherman, Tex.

The switch to the new system followed collation of data from laboratory investigations and experience with a vacuum system designed and installed in '40. The findings convinced the firm that continuous vacuum bleaching—

1. Gives lighter oil colors
2. Stabilizes oil against oxidation and flavor reversion
3. Decreases formation of free fatty acid
4. Removes soap more completely
5. Requires less adsorbent
6. Reduces catalytic poisoning in hydrogenation, and
7. Improves flavor stability of hydrogenated and deodorized oils

The company completed the two new identical vacuum bleaching units at Sherman last February. One is being used to process refined cottonseed oil, the other refined soybean oil. The original 1940 equipment is now used to bleach hydrogenated vegetable oils.

Bleached oils are required by the company in the course of manufacturing its various shortenings, salad oils, margarines and cooking oils. It also sells the oils to other processors.

Prevailing commercial practice is to bleach in a batch, open-kettle system where little or no exclusion of atmospheric oxygen is possible. Technologists of the company decided that under similar conditions, bleached oils of appreciably lower colors would be obtained if the operation were performed under vacuum or otherwise with the exclusion of oxygen. They also concluded that in vacuum bleaching the adsorbent clays of low pH are more responsive than clays of high pH with respect to oil stability and removal of color.

Large-Scale Comparisons

During the eight years' use of the first unit in bleaching refined vegetable oils, the firm made a number of large-scale tests of its performance, as compared with conventional atmospheric methods. In the latter operations, different percentages of adsorbent were added to batches (60-90,000 lb.) of refined oils in an open kettle equipped with a mechanical agitator. After being heated to 220-240 F., with agitation, the slurry was pumped directly through two closed filter presses in series. The filtered oil was continuously cooled to 160 F. or lower.

Test results presented here compare atmospheric batch bleaching with the vacuum method as performed in the 1940 unit, rather than in the two new vacuum units. For it has not yet been practicable to employ the new units in an extensive series of tests.

How company got down to figures—continuous vacuum vs. atmospheric batch

TABLE I—Color Reductions Compared

Type of Adsorbent	pH of Adsorbent	Type of Oil Bleached	Number of Tests Made	Average Percentage Adsorbent Used		Average Color of Bleached Oil	
				Atmos.	Vacuum	Atmos.	Vacuum
Natural Clay 1	6.5	Cottonseed	3	1.27	0.98	2.6	2.4
Natural Clay 1	6.5	Soybean	1	1.48	1.46	2.4	3.1
Activated Clay 1	3.6	Cottonseed	2	1.57	1.60	3.0	2.8
Activated Clay 1	3.6	Soybean	2	1.55	1.40	5.4	5.2
Activated Clay 2	3.2	Cottonseed	3	1.46	0.90	2.4	2.1
Activated Clay 2	3.2	Soybean	1	1.32	1.30	2.4	2.5
Activated Clay 2 plus 4% carbon	...	Soybean	1	0.92	0.92	3.7	2.5
Activated Clay 1 and 2	...	Soybean	1	1.011	0.962	4.2	2.5
General average (14 tests)				1.37	1.16	3.2	2.9

TABLE II—Effect on Bleaching Economy

	Percent Adsorbent Used		Color (Red)	
	Atmospheric	Vacuum	Atmospheric	Vacuum
Average data (Table I)	1.37	1.16	3.2	2.9
Interpreted	1.45	1.12	3.0	

TABLE III—Effect on Oil Stability

Type of Oil	Atmospheric Batch		Continuous Vacuum	
	Stability of Refined Oil, Hr.	Stability of Bleached Oil, Hr.	Stability of Refined Oil, Hr.	Stability of Bleached Oil, Hr.
Cottonseed	14.1	11.5	13.4	12.5
Soybean	13.2	10.5	13.0	12.0
Average	13.65	11.0	13.2	12.25

TABLE IV—Effects of Types of Adsorbent on Stability (Swift Method)

Adsorbent Used	pH of Adsorbent	Percent Reduction in Oil Stability During Bleaching	
		Atmospheric	Vacuum
Natural Clay	6.5	21	14
Activated Clay 1	3.6	15	
Activated Clay 2	3.2	25	4

TABLE V—Effect on Free Fatty Acid Increase

Adsorbent Used	pH of Clay	% Free Fatty Acids Atmospheric Batch		% Free Fatty Acids Continuous Vacuum	
		Original	Bleached	Original	Bleached
Natural Clay	6.5	0.070	0.070	0.065	0.060
Activated Clay 1	3.6	0.063	0.073	0.117	0.113
Activated Clay 2	3.2	0.087	0.117	0.090	0.093

TABLE VI—Effect on Soap in Bleached Oils

Bleaching Procedure	Parts/Million Soap in Refined Oil (Average)	Parts/Million Soap in Bleached Oil		
		High	Low	Average
Batch Atmospheric	103	55	14	32
Continuous Vacuum	114	20	3	15

However, the design and operation of the new units are basically like those of the older one. For this reason it is considered that the test results are substantially representative.

Color-Test Details

Comparison of color reductions obtained in the atmospheric-vs.-vacuum bleaching of refined cottonseed and soybean oils, when using different types of adsorbent clay, is shown in Table I.

Identical oils were used in only 3 of the 14 comparative tests—once when using refined cottonseed oil while employing activated clay 2, and on two occasions when using refined soybean oil with a mixture of activated clays 1 and 2, and activated clay 2 plus 4 percent activated carbon. All data obtained in these three tests favored continuous vacuum bleaching.

With respect to the other comparative tests, although identical oils were not used, the average refined color and the official bleach color of the oils used in each type of bleaching were practically the same.

The refined oil processed by atmospheric bleaching had a color of 35 yellow 8 red, while those processed by vacuum bleaching had a color of 35 yellow 7.8 red. Both oils had an official bleached color of 20 yellow 2.6 red. This means that the oils, before bleaching, were practically identical and had the same potential bleachibility—as shown by the identical official test bleached colors.

However, as seen in Table I, when these oils were bleached by the atmospheric process, the average red color obtained was 3.2 red, or 0.6 above the official bleach color. At the same time, the vacuum process gave a 2.9 red color, or 0.3 above the official bleach.

Color difference of 0.3 red under these circumstances is very significantly in favor of the vacuum process. This is especially true when it is considered that 0.21 percent less adsorbent (1.37 percent for atmospheric and 1.16 percent for vacuum, as shown in Table III) was used in the vacuum process than in atmospheric. When clays of low pH are used, the advantage is more pronounced.

Savings in adsorbent requirements, obtained through continuous vacuum bleaching, have also been calculated to suggest appreciably larger savings as represented in cost of oil retained in spent adsorbent. On the average, spent adsorbent contains 25-30 percent oil regardless of the method.

Stability Score: 7 to 20

Tests made by the company also indicate that the stability of vacuum bleached oils is, on the average, better than the stability of oils bleached under atmospheric conditions. Stability data, presented in Table III, show that the average decrease in oil stability in open-air processing was 20 percent, compared to only 7 percent in vacuum processing.

Effects in respect to type of adsorbent used in the two processes have also been examined. It was concluded that with vacuum bleaching, natural clay, which is least responsive to reduction of color, also caused the largest reduction in oil stability. Results are shown in Table IV.

In theory, no free fatty acid increase can occur during the bleaching of a completely dry oil with a completely dry adsorbent. In the absence of moisture, the hydrolysis of a soap or neutral oil cannot occur.

In practice, however, some moisture is usually found in refined oils and in the bleaching adsorbents. So some hydrolysis ordinarily takes place. Table V shows the amounts of free fatty

acids present in the oils before and after bleaching by both systems when employing three types of clay.

Soap content of the unbleached oils averaged slightly over 100 ppm. The figures indicate that from the standpoint of free fatty acid increase in bleaching when adsorbents of low pH are used, continuous vacuum bleaching has a distinct advantage over the atmospheric process. No significant rise in fatty acids occurred during continuous vacuum bleaching, regardless of the pH of the adsorbent.

Why It's Easier to Remove Soap

Comparative tests also show the vacuum operation markedly advantageous with respect to removal of soap from refined oils. This data is shown in Table VI. The advantage is undoubtedly due to better dehydration of oil and adsorbent when using the vacuum process. A completely dehydrated soap is insoluble in oil whereas a hydrated soap seems to be somewhat soluble even in dry oil.

Because soap is a catalyst poison, it would be anticipated that vacuum bleaching will lengthen the active life of nickel catalyst employed in hydrogenating bleached oils. That this was a fact was demonstrated by examinations of catalyst consumption during a period of several months in which a continuous atmospheric process was used, and also during a comparable period using the vacuum process.

Catalyst consumption per unit weight of oil hardened to a definite reduction in iodine value, while maintaining the same manufacturing standards with respect to selectivity, was about 25 percent less when processing the vacuum bleached oil. Although the benefit is most certainly due, primarily, to soap removal, the gain may be attributed in some degree to better oil stability.

It is to be expected that because oxidation of oil during bleaching is notably reduced in the vacuum operation, and since stability of the bleached product with respect to subsequent oxidation is notably improved, some betterment in flavor characteristic of the processed bleached oil should occur.

The company is sure that continuous vacuum bleaching does improve flavor and flavor stability of deodorized oils —and to a considerable degree. This opinion is held even though it is based upon comparison between the quality of deodorized oil before and after the vacuum system was installed rather than on results of individual tests.

Two flavor comparison checks of oils produced by atmospheric vs. continuous vacuum bleaching have been made under controlled conditions. Refined soybean oil was used in these tests, and equal percentages of an activated clay were employed. It was found that with respect to flavor stability after deodorization, the vacuum bleached products, both unhardened and after hydrogenation, were distinctly superior.

Here are a few of the new wrinkles of the two recently-installed units. In the old set-up the stream of oil adsorbent slurry from the slurry mix tank entered the upper chamber of the vacuum tower and there impinged on a baffle plate in order to reach the dispersed condition necessary to deaeration. In the new units a spray nozzle has superseded the baffle plate. This change was adopted because it was considered that the spray dispersion would be more effective. Also in the old unit, oil from the upper chamber was passed through a steam-to-oil heat exchanger in order to raise the oil temperature to the necessary point before it entered the lower section of the tower. Now, in the new units, part of required heat is obtained by passing the oil leaving the upper chamber through an economizer, or oil-to-oil exchanger, where this oil receives heat from hot oil leaving filter presses.

Use of concentric pipe heat exchangers in the two new units has superseded the multi-pass, shell and tube, steam-to-oil exchanger formerly used. This change was adopted in order to eliminate possible plugging and channeling. Another important change was the installation of closed filter presses, rather than open. The closed have the advantage of preventing contact of the hot oil with oxygen—thus eliminating oxidation at that point. These new presses are of aluminum alloy instead of conventional cast iron in order to further protect the oil stability.

How System Operates

The details of the procedure with the new continuous units (including numbers referring to units shown in the flow diagram on page 81) are as follows:

Refined cottonseed oil or soybean oil from refinery storage is first pumped into a scale tank (1) having a capacity of 140,000 lb. Here the oil is weighed.

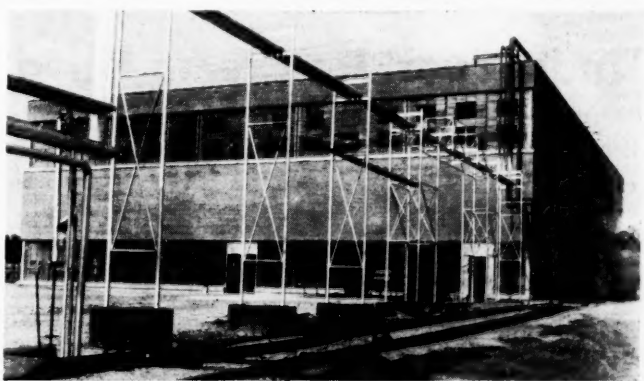
Next a centrifugal pump moves the oil into one of two refined oil supply tanks (2). Each of these tanks is 16 ft. high by 14 ft. in diameter and has a capacity of 140,000 lb. The tanks are fitted with steam coils to furnish whatever heat is needed to keep the oil temperature at a point adequate to facilitate pumping and to meet the temperature requirement of the oil entering the deaerating and dehydrating chamber. Steam is not kept in the coils constantly, since the required oil feed temperature averages only 130 F.

Oil from the supply tanks is then pumped into a small steel slurry tank (3) having a capacity of 530 lb. Here the oil is mixed with adsorbent clay, which is dumped manually from sacks into an open hopper (4). The bottom of the hopper has a screw-type, motor-driven conveyor. The rate of entry of clay from hopper into slurry tank is manually controlled by adjusting a Draver feeder, which varies the speed of the screw conveyor. The screw carries the clay into a duct, through which the material drops by gravity into the top of the slurry tank.

On the average, the rate of clay input to oil is 0.5 to 1.25 percent by weight of the oil entering. Clay consumption is obviously kept at a minimum because of material cost and loss of oil contained in the clay leaving the filter presses.

The clay-oil ratio varies appreciably during the course of a "run". At the start, clay is fed into the slurry tank at about 3.0 percent, but this figure is quickly reduced as clay builds up on the press, where additional bleaching action occurs.

In the slurry tank (3), mixing occurs



WHERE IT'S DONE. Refining and bleaching building of Mrs. Tucker's Sherman plant, showing conduit lines and convenient railroad spur.

with the entry of oil through two opposing nozzles. As these streams come into contact, the clay enters their field of play from above and the resultant turbulence produces an intimately mixed material.

Mixture from the slurry tank passes through a centrifugal pump and is sprayed, at a temperature of 130 F., into the upper part of a vacuum tower (5). Total height of this tower is 12 ft. and its diameter is 4.5 ft.

There is about 12-min. retention time in the upper part of this tower. Vacuum is maintained at 1.5-2.0 in. of mercury absolute pressure. Here occurs the "flashing off" of gases dissolved in the oil and adsorbed in the clay. Part of the moisture present in the materials is also removed.

As the slurry accumulates in the bottom of the upper chamber, it is pumped out into an economizer (6), consisting of a concentric pipe heat exchanger. The slurry picks up heat from oil that has previously left the filter presses. The slurry then passes through a steam heater (7), similar in type to the heat exchanger, and from there it is sprayed at about 230 F. into the lower half of the vacuum tower (5). Here, it is retained for about 10 min. while the bleaching occurs.

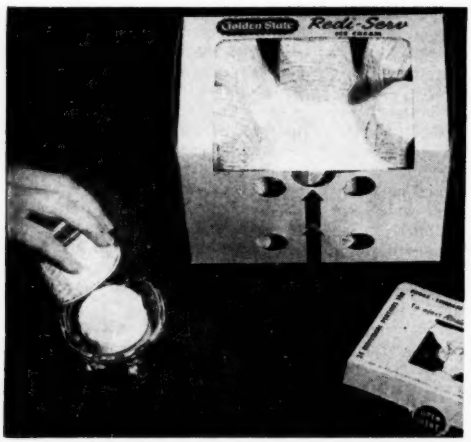
Also at this point, gaseous decomposition products and "bound" water are released. They pass up through a chimney into the upper chamber and are drawn out through the top of the tower into the vacuum system.

The oil-clay slurry is drawn by centrifugal pump from the bottom of the lower chamber and discharged through two 6-in. aluminum plate-and-frame closed filters (8), connected in series, for removal of the clay. At any given time, a third spare filter is out of the system being cleaned. Filter cake is removed manually and dropped into dump trucks and discarded.

As mentioned above, the bleached oil leaving the second filter is passed through the economizer to heat the relatively cool oil discharged from the upper half of the vacuum chamber. Then the bleached oil is passed through a water-cooled aftercooler, where the oil temperature is reduced to below 150 F. before entering bleached-oil storage. It is then ready to be processed into the finished product or to be shipped to other manufacturers.

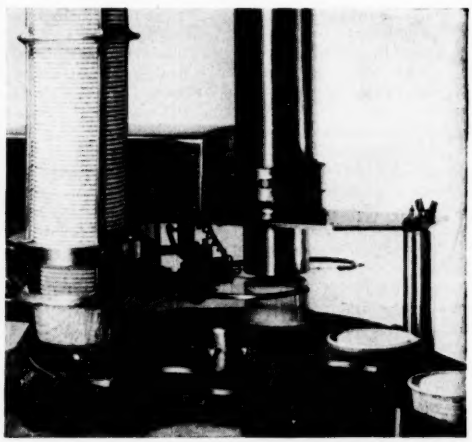
The refining units were installed by the Girdler Corp., which is licensed by Mrs. Tucker's Foods to sell and erect installations embodying the new process.

Easy to serve ice cream . . .



BY PRESSING bottom of cup, ice cream is dispensed. Cups are delivered to store packed 24 to the carton.

. . . comes from new machine



MACHINE positions souffle cup under filling spout. Then hot wires cut portion, which drops into cup's center.

"Individual" Ice Cream Filled Unique Way

Servings are factory-packed direct from continuous freezers. "Hard cream" filling procedure makes dispensing from cups easy

AN INDIVIDUAL portion of ice cream, packaged in a soufflé cup for sanitary and economical dispensing, is the latest development in controlled servings. Process and special filling machine for Redi-Serve, as it is called, were developed by Golden State Co., Ltd., San Francisco.

Cups are filled with ice cream as it comes from continuous freezers.

In the development of the filling machine (see photo) two special problems were faced: (1) How to get around the fact that soft ice cream sticks to all surfaces of a container and cannot be easily ejected, and (2) how to cut uniform portions speedily.

To overcome these difficulties, ice cream is first frozen to an unusually "hard" consistency. Then, as it leaves the filling spout, the portion is severed by two electrically heated cutting wires. Cups are automatically positioned below the filling spout so that severed portions drop without touching the cup sides, and the ice cream is easily dispensed by pressing a thumb against the center of the bottom of the cup.

Filler is made by Redi-Serv, Inc., 646 Michigan Blvd., Chicago.

Highlights of IFT Convention

PART III

Final report on San Francisco sessions. Dairy industry problems, improving quality of frozen fruits, vegetables, poultry and fish, pickle and fish spoilage discussed

FI STAFF

Off-Odors and Bacterial Slimes on Storage Poultry. John C. Ayres, Iowa Agricultural Experiment Station, Ames, identified various species of Pseudomonas bacteria to be responsible for development of off-odors followed by bacterial slimes during storage of poultry meat. Off-odor developed as the bacterial count increased to 10,000,000 per gram of meat and became evident in 2 days at 50 deg. F. and in 4 days at 40 deg. F. Slime was evident when the bacterial count reached 100,000,000 per gram of poultry meat. Studies were carried on at 32, 40 and 50 deg F., respectively.

Defrosted frozen chicken showed evidence of deteriorative changes after average storage time of 2 to 3 days at 50 deg. F.; 6 to 8 days at 40 deg.; and 16 to 18 days at 32 deg. Storage life was found to be dependent upon bacterial population on the poultry meat at beginning of storage period. This population, on either the whole or cutup chicken, is dependent upon sanitary practices in the processing plant, particularly during the scalding and dressing operations.

Frozen Storage of Turkey Steaks. According to A. A. Klose, Western Regional Research Laboratory, Albany, Calif., light meat turkey steaks are more stable during storage than dark meat steaks. In either case, good packaging and uniform low storage temperature are requisites for storage of 6 months or longer. Recommendation was made that the frozen turkeys be stored whole or in halves and steaks cut at time of marketing. Inclusion of viscera or rendered fat speeds up deterioration of the packaged steaks, regardless of packaging material used.

Fish and Fish Products. Research and engineering problems involved in developing a new type of canned salmon—skinned-boneless—was described by Ralph Berglund, Pacific American Fisheries, Bellingham, Wash. The company's research department worked on this project for three years, trying seven different machines, before a successful means was developed for skinning and boning the fish.

Mr. Berglund noted that a weight loss of from 9 to 12 percent resulted when bones and skin are removed, and that some problems have been experienced with crystal formation in the boned fish.

Much research has been carried out on tanning salmon skins as a byproduct of the new process. A product comparable in price to cobra skin has, he said, been made experimentally into women's shoes.

Speaking on inedible byproducts of fish, Dr. Sven Lassen, Van Camp Laboratories, Terminal Island, Calif., offered two reasons for a regrettable lack of progress in the fish byproduct field: The decentralized nature of the industry, which makes it difficult to gather fish wastes at a central point for efficient utilization, and the fact that the industry has employed a comparatively small number of scientifically trained persons to develop these products. Less than half-dozen of the many possible products are turned out on a commercial basis.

Technological progress also has been slow. He cited the prevalence of the practice of recovering fish oil by the settling process instead of the more efficient centrifugal method. He also deplored the fact that fish meal is dried in a way that doesn't take into consideration the possible loss in digestibility and nutritive value as a result of thermal and other maltreatments in processing.

C. H. Castell, Fisheries Research Board of Canada, reported that his agency's experiments showed the major amount of fish spoilage occurring on fishing boats—20 to 30 percent of fish landed is spoiled or near spoilage—is caused by heat leaks into the iced cargo, around the bulkheads, at the top and next to the skin of the boat.

The board discovered it could reduce heat leaks at deck and bulkheads with a 2-in. layer of cork insulation. The skin of the boat was cooled by pumping refrigerated air into an air-layer formed by lining the boat with an aluminum alloy. Fish iced on a boat so equipped proved 100 percent usable after seven days at sea. Two inches of rubber insulation covered with aluminum at the skin side of the boat, while not as satisfactory as the refrigeration, helped to reduce heat leaks into the iced cargo.

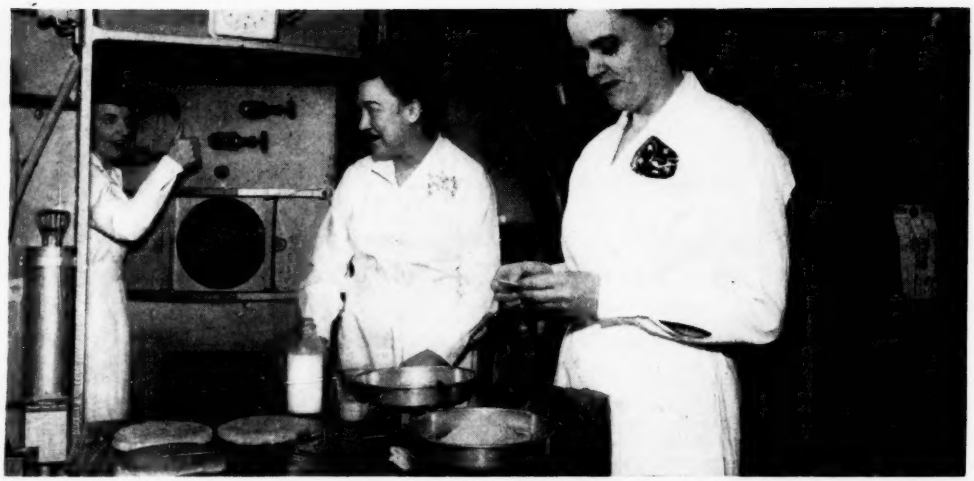
Two other factors commonly believed to cause shipboard spoilage—the failure to use fresh water in cleaning, and the lack of sterilization of cargo space between voyages—were found, in actuality, to have no effect on fish spoilage. Washing down the ship with ordinary sea water was found to be adequate.

Mr. Castell also noted the development of a device for removing skin and slime on fish while filleting. He said it has cut the bacteria count by some 99 percent—appreciably lengthening the keeping time of the fresh fillets.

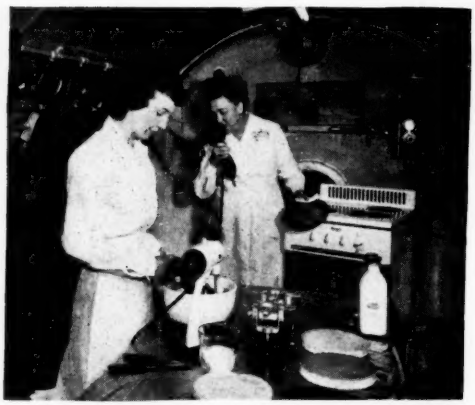
Maurice Stansby, Fish & Wildlife Service, Seattle, described successful experiments in filleting and refreezing, on land, fish that had been frozen at sea. One experimental cargo was frozen at sea, half in the round and the other filleted. It was discovered that the portion frozen at sea, then filleted and refrozen on land, was of better quality than that filleted at sea, primarily because of the better sanitary conditions under which filleting was done on land.

Dairy Industry Problems. Disposal of waste and sewage in the dairy industry needs much attention, according to an analysis of dairy industry problems by Paul F. Sharp, director, University of California Agricultural Experiment Station, Berkeley. Great improvement could be made in dairy plant equipment to reduce sewage.

(*Turn to page* 184)



"GOING UP!" is signal to seal chamber, draw out air, and start the "high" baking. Cakes seen on left are "controls."



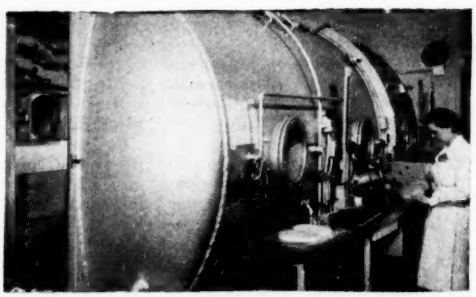
WHEN each cake is done, baker phones outside-technician to adjust pressure (affected by release of oven heat).

Cake-Bake "Flights" For Better Recipes

Pressure chamber simulates baking atmospheres of either upland or lowland housewives—thus indicating adjustments for right use of mix

ALTITUDE used to be troublesome for the mix recipe makers at Pillsbury Mills. The same recipe might turn out a fine, light cake at Boston and a crumbling pile in mile-high Denver. And sending researchers to various "altitude" cities was costly. Then the "flying kitchen" was hit upon, making it possible to do the work right at home. The kitchen is a low-pressure chamber that the U. S. Air Force was about to dismantle. The company got permission to use it. After an electric oven and other equipment were moved in, a two-month test was run to establish recipe adjustments for just about any altitude.

TEST CAKES are checked against control cakes, and data recorded, at end of day's "up high" baking.



OUTSIDE VIEW shows control instruments. Panel bench proved a convenient place to lay cakes.

We Think . . .

■ F&DA Authority Should Be Clarified or Strengthened

It is important that a full and convincing review be made as to the authority of the Commissioner of Foods & Drugs with respect to the addition of chemicals to foodstuffs. The importance of this question is spotlighted by a recent frank but cautious statement from Deputy Commissioner Charles W. Crawford.

Rumor had it that breads containing certain emulsifiers would be seized on the ground that such breads were adulterated. Commissioner Crawford stated categorically that there was no intention to take such drastic action. That was a wise answer. And it is very well to have it put clearly before the industry.

But there remains unanswered the question as to whether F&DA should have further authority to regulate new foods or the addition of chemicals to foods. Some believe that the general provisions of the law were intended by Congress to give the Administration ample authority to do just that whenever there was any serious doubt as to public safety or the reasonableness of new products or new projects. However, the executives of F&DA do not feel that they have this authority.

Therefore, government and industry lawyers should make a critical analysis of this situation. A joint study by specialists in food law should be presented to the Attorney General for his review. If he officially rules that the Commissioner does *not* have necessary authority, then Congress should be asked to create it. If he does find, as we hope, that the present law *would* justify the essential proceedings to protect the American people, the Commissioner will have ample basis on which to proceed in the discipline of the unreasonably venturesome who may carelessly undertake "progress" without adequate scientific care.

Public interest demands that there be sufficient authority to avoid the creation of public hazards.

■ More Factories Answer to World Agriculture Problem

Worry about food shortages took on a global aspect at the recent United Nations Scientific Conference on the Conservation and Utilization of Resources. And as if the present problem wasn't big enough, the added burden of an ever-increasing population was weighed heavily.

The estimated number of mouths to be fed was only 400 million in 1630. Two hundred years later, the number had doubled. And at the turn of this century it had quadrupled, reaching 1,600 million. Today, it stands at 2,300 million, nearly six times what it was 300 years ago. And babies still are being born much faster than old people depart from this world.

The earth is getting too crowded, in the opinion of one group of scientists. These savants say it takes 2½ acres to feed a person properly, but that there now are less than 2 acres of cultivable land per capita.

"Not so," says a more optimistic school of experts. Man has not even begun to touch some of his potential food supply. Not only can production per acre be increased immeasurably, but there are great areas of fertile land which need only to be cleared or irrigated to make them productive. Then there are lots of fish in the oceans, which cover 70 percent of the earth—not to mention the great possibilities of fish farming in inland ponds. And if worst comes to worst, food can be grown by chemiculture or produced by "synthetic" processes.

We go along with the optimists. And we believe that the solution to the world's food problem lies in industrial development of backward areas. Give the people jobs and money to buy food, then farming will increase—both in acreage and in production per acre—as a sound economic enterprise. Make farm equipment, fertilizers and insecticides in the future factories of backward countries, and farmers will turn them into more and more food.

So let us not be hasty about plowing under any new crops of babies.

■ Nutritional Ills of "Healthy" People Significant to Processors

It is well-known that the lower income groups eat neither enough food for optimum health, nor the proper selection of foods. But it may come as a surprise to many that the food intake of typical families with reasonably adequate income is too low for proper nourishment.

This somewhat unexpected situation was revealed in a 1-year study of 64 families, including 239 individuals of all ages, in a large Pennsylvania city. In selecting the families for the experiment, the first requirement was that every member be in apparent good health.

The incomes of two-thirds of the families ranged from $2,500 to $5,000 a year, and those of the remaining third exceeded $5,000. In other words, all families could afford the food believed necessary for optimum nutrition. Yet only 28 percent were eating enough food to meet recommended caloric requirements.

Participants in the nutritional study were given thorough medical examinations at the beginning of the investigation, after 6 months, and at the end of the experiment. The initial examination showed unsuspected physical conditions among these supposedly healthy people, revealing that several of them had eaten their way to poor health. Most of the group suffered at least minor ills from nutritional deficiencies, common among which were fatigue and nervous habits of dietary origin. The overall medical rating was Class 2, or just under par, and 20.6 points below the 100-point optimum.

Homemakers in the group were taught what and how much to feed their families, and how to prepare it. After one year of proper eating, the group showed great improvement. Not only did the average medical rating rise, but there was marked improvement in condition of skin, gums and tongue; reflexes were better; and there were less fatigue and nervousness. Other improvements were fewer colds, improved child growth, and better weight. The medical rating increased, in fact, until many of the subjects were

in Class 1, and individual ratings rose as much as 14 percent.

It is interesting to note that adult women made the worst showing at the beginning of the experiment. Nearly 32 percent were consuming less than three-fourths of the recommended calorie intake, and their meals were not balanced. No less than 57.8 percent of the women were underweight.

Teen-age girls followed the faulty eating habits of their mothers, 30.8 percent consuming less than three-fourths of the recommended diet. And 50 percent were underweight, most of them by a great margin.

Children under 12 years made relatively good initial showings, although their nutritional health was far from ideal. Men and teen-age boys were in better health than the women and teen-age girls, but did not rate as high as the young children.

Of particular significance to food processors are the changes in food consumption which contributed to the better health of 64 families. Consumption of milk and cheese increased 24 percent; lean meats, 47 percent; eggs, 16 percent; citrus fruits and tomatoes, 15 percent; leafy green and yellow vegetables, 24 percent; potatoes, 14 percent; other fruits and other vegetables, 9 percent; flour and other cereals, 21 percent; and fats, 30 percent.

Yet the food bill increased only 7.1 percent in a period when the regional food-price index went up 2.3 percent. Care in food selection accounted in large part for the small increase, but that involved curtailment of "luxury" foods.

Adequate and properly balanced breakfasts and lunch-box meals contributed much to the nutritional improvement during the study.

Conducted by Pennsylvania State College and Westinghouse Electric Corp., this study contributes significant dietary information by revealing that a great many so-called healthy people are suffering from nutritional deficiencies. Processors, as well as home economists, can urge increased consumption of foods on a balanced-diet basis. And processors should continue to improve the nutritional qualities of their products.

■ Peacetime Progress Will Come From Research on Army Foods

You might assume that few unsolved technological problems would be involved in feeding our armed forces in the event of another war. One could arrive at such a conclusion on the basis that our soldiers were adequately nourished in the last war, under nearly all conditions of operation and climate.

So it may come as a surprise to many in the food industry that no fewer than 84 top-priority research problems have been defined by the QM Food & Container Institute. These range from the development of new products, through improvement in quality, to better packaging.

Fortunately for our long-range military preparedness program, an agency was set up some time ago to tackle such problems with high-caliber brains and good research facilities. We refer to the Associates, Food & Container Institute, composed of food and container experts employed by companies in these industries. The Associates serve as an advisory committee to the armed forces, and they also carry out specialized types of investigation on a year-round basis through the laboratory facilities of affiliated concerns and educational institutions.

This is a highly commendable activity, not only because it will better prepare the country in event of a future war, but because the solutions to a great many of the 84 problems will be of practical value to the food processing industry in peacetime.

One problem is the modification of presently available canned meat items to eliminate "canned" flavor and improve texture. And the storage life requirements are at least 6 months at 100 deg. What meat packer wouldn't like to have the answers?

Then take the problem of developing commercial methods for preparing flour with a moisture content as low as 2 percent for use in cake mixes to improve storage life. Commercial manufacturers of prepared mixes would profit from the solution of this one.

And here's one of interest to the dairy industry: A dry whole milk which, after storage for six months at 100 deg. F., will reliquefy readily with manual stirring and will more closely simulate fresh fluid milk in appearance and palatability. Such a product ought to build quite a nice peacetime business for a processor.

Improvement in dehydrated vegetables is another need of the armed forces. A new war again would bring a big demand for these easily shipped and stored foods. For one thing, the armed forces would like to have desiccated precooked mashed potatoes which reconstitute readily and have the flavor, color, aroma and texture comparable to the mashed potatoes you eat at home. Further, the storage life of this product should be 6 months at 100 deg. F. We know of several food companies which would like to have such a product to sell to housewives.

It is not likely that all the 84 problems will be solved to the Army's complete satisfaction—at least not this year or next. But the fact that they have been defined and have had technological effort focused upon them augurs progress.

And we urge every one in the industry to give any help they can to the Associates, Food & Container Institute. If you are not one of the associates, perhaps you should be. Remember that an army not only travels, but also fights on its stomach. And peacetime food processors prosper from scientific progress.

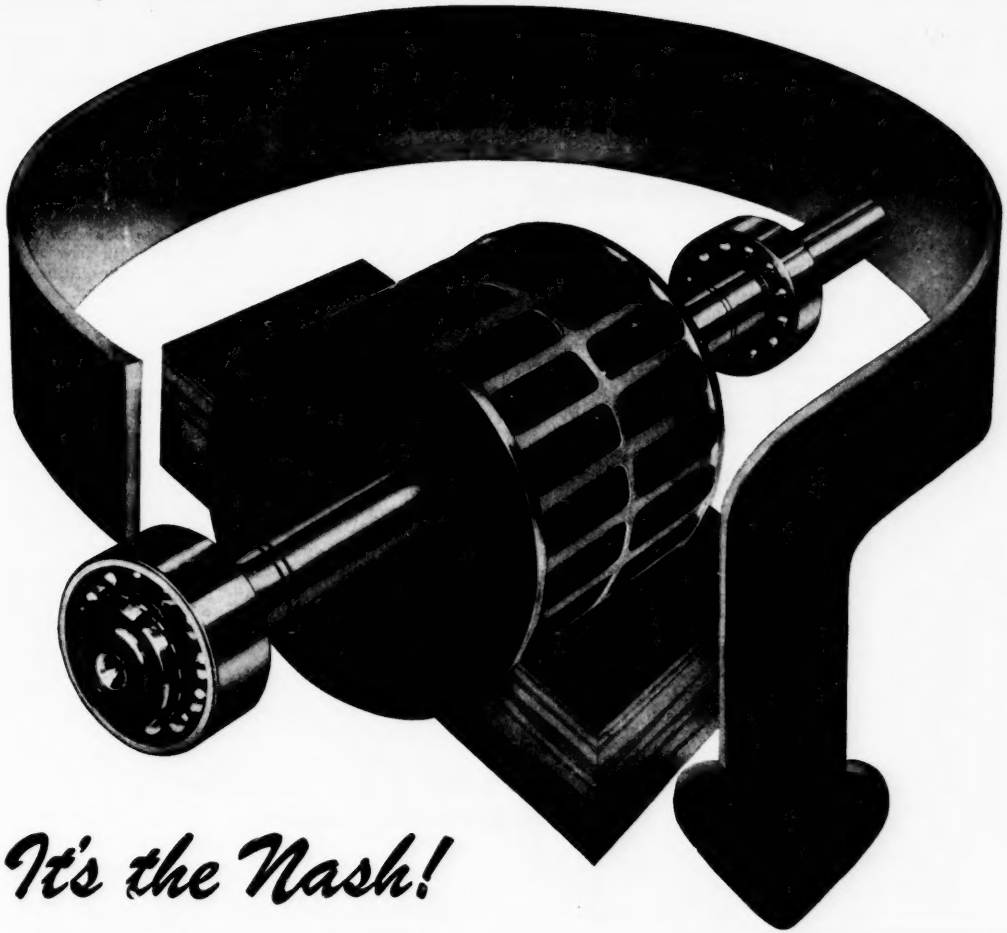
■ Better Technics Are Needed in Storing Surplus Grain

Stories about the government's intention to build storage space for 250,000,000 bu. of grain prompt us to comment on the rather indifferent state of knowledge of proper grain storage.

As long as our government is determined to continue price support for agricultural commodities, it must be prepared to buy enormous quantities of grain. It must also be prepared to provide storage for many years. There is no point in accumulating vast stores of grain only to have them later destroyed or damaged by insects.

Low cost, insect-proof grain storage is needed, particularly in the warmer areas. The time-honored procedure of watching temperature rises in grain tanks to detect insect damage—and them transferring the grain from one tank to another to destroy the insects—is not our idea of good food technology.

An ideal solution of the problem would combine low-cost treatment of the grain (to rid it of all insect infestation) with equipment design that would prevent reinfestation. It should ultimately be possible to store grain safely for a quarter century without further attention. Admittedly, storage for such a period would not be economical but then neither is much of our price-support program. But even if we must support prices, let us not support insects.



It's the Nash!

The ability of Nash Compressors to maintain original performance over long periods is no accident. Nash Compressors have but a single moving element, the Nash Rotor. This rotor is precision balanced for long bearing life, and it revolves in the pump casing without metallic contact. Internal lubrication, frequent cause of gas contamination, is not employed in a Nash. Yet, these simple pumps maintain 75 lbs. pressure in a single stage, and afford capacities to 6 million cu. ft. per day in a single compact structure.

Nash Compressors have no valves, gears, pistons, sliding vanes or other enemies of long life. Compression is secured by an entirely different principle of operation, which offers important advantages often the answer to gas handling problems difficult with ordinary equipment.

Nash Compressors are compact and save space. They run without vibration, and compression is without pulsation. Because there are no internal wearing parts, maintenance is low. Service is assured by a nation-wide network of Engineering Service offices. Write for bulletins now.

No internal wearing parts.

No valves, pistons, or vanes.

No internal lubrication.

Low maintenance cost.

Saves floor space.

Desired delivery temperature Automatically maintained.

Slugs of liquid entering pump will do no harm.

75 pounds in a single stage.

NASH ENGINEERING COMPANY

31 WILSON, SO. NORWALK, CONN.

What Readers Think

Changes Needed in Food Hearings But F&DA Criticism Unfair

Mr. Editor:

We have read, with considerable interest, the editorial on the bread standards hearing (p. 85, June FI).

We agree, for example, that the standardization procedure should be simplified to the greatest extent practicable. Perhaps the most important single factor to that end would be a stricter, though still reasonably liberal, application of the basic rules of evidence. The hearsay rule should not be virtually ignored as it now is. Cross examination of witnesses should be confined to the scope of direct examination. The records of hearings should not be cluttered, and effective cross examination impeded, by allowing witnesses to introduce so-called "exhibits" containing often-voluminous statements which should be presented openly as oral testimony. There should be assurance of adequate opportunity for parties and their counsel to study exhibits and offer objections. There should be more consideration by presiding officers, and fewer offhand rulings on objections and motions.

These and other deficiencies shown by experience should be remedied by more adequate rules of practice and procedure, although it is only fair to say that the Federal Security Agency already is working on new rules with the assistance of the bar.

We agree also that the baking industry was subjected to unwarranted and unfair reflections by publicity resulting from consideration of the so-called chemical emulsifiers or bread softeners. The suppliers of those, not the baking industry, proposed their inclusion. This association, incidentally, after considering the evidence presented by those suppliers, recommended that these chemical emulsifiers be disapproved because it believes that appropriateness of such materials of non-biological origin has not been and cannot be shown. Yet statements in the *Congressional Record* and the press gave the impression that their use was proposed by the baking industry and would (a charge in any event unwarranted) be resorted to for purposes against the public interest.

However, we desire—as we know you do—to be fair to the Federal Security Agency and the Food & Drug Administration. We have every reason to believe that those false statements were the doing of outside sensationalists, not of that Agency. Also we believe you have been misinformed in charging the Agency with "atrocious mismanagement," "gross impropriety" and "use [of] the *Congressional Record* as a means of implying that bakers are going to cheat their customers if they are given a chance." The Agency appears to us to have maintained a reasonably objective and open attitude, and not to have inspired such statements in the *Congressional Record* or elsewhere.

In food standards proceedings, the law requires that opportunity for full hearing be given to every interested person. If the Food & Drug Administration has mismanaged the bread hearings, it has been by allowing even too full a hearing on the proposed ingredients in question in order to avoid any charges of arbitrariness. But if there has been mismanagement, it cannot by any standard of public conduct be characterized as atrocious.

There is much to be criticized in the theory and procedure of food standardization. We still are concerned, for example, that progress in food technology may be unduly impeded unless provision is made for general investigation of harmlessness of new food materials independently of consideration of particular food standards and unless provision is made for licensing of experimental commercial use of new ingredients. And we already have mentioned some of the faults of present procedure.

At the same time, it is no more than fair to say that we have so far found the Food & Drug Administration outstanding among Federal agencies in its fairness and reasonableness, and in the benefits it has helped to accomplish for industry and the public. And we do not believe it to be deserving of the condemnation expressed in the editorial in your June number.—*Frank G. Jungewaelter, Director of Research & Merchandising, Associated Retail Bakers of America, Chicago.*

More To Be Said About Great Pioneers In the Meat Packing Industry

Mr. Editor:

Seldom do I have any occasion to take exception to items published in FOOD INDUSTRIES. There was however, one item on page 86 of your July issue which could be improved by few minor changes.

G. F. Swift, Sr., when he transferred his activities to Chicago in 1875, went there to buy livestock for shipment East, but soon saw the prospects for moving meats. However, he did not start slaughtering in Chicago until Dec. 1, 1877.

P. D. Armour did not return from California to work in the Milwaukee plant of John Plankinton. On his return from California, and after his visit to his home town in New York, he returned to Milwaukee and went into partnership with Frederick B. Miles in March, 1859. That partnership was dissolved in 1863, although it was very prosperous. But Mr. Armour had been invited by Mr. Plankinton to join him as a junior partner under the firm name of Plankinton and Armour. Armour & Company, in 1867, began slaughtering hogs in Chicago under that name and later took up the slaughtering of cattle and sheep. In 1870 Armour & Company took over all Chicago operations of Mr. Armour and his brothers.

Your article does not mention one of the very great names in the packing industry, that of Nelson Morris, whose experience antedated both the Swift and Armour families in the industry, and whose firm was responsible for the training of Thomas E. Wilson.

In my humble judgment there was ample glory for all of those great pioneers without overlooking and disparaging the work of any.—*C. B. Heinemann, President, The National Independent Meat Packers Association, Washington, D. C.*

Pioneering by Nelson Morris

At the request of FOOD INDUSTRIES, *Mr. Heinemann supplied the following interesting highlights of Nelson Morris' pioneering achievements.*

Nelson Morris (1839-1907) was born in Hechigen in the Black Forest

(*Turn to page* 182)

MUDDLING in High Places

It is time for men in Washington and London to stop toying with the problem of international trade. We of the democratic West are at a turning point in our economic affairs. A false step by either the United States or Britain could lead quickly to disintegration of trading between the people of the world as we have known it for the past hundred years. Recent meetings of diplomats in London and Washington have not lifted us out of this danger.

By two simple tests you and I can measure the sincerity of the men in Washington and in London who are trying to solve what they call "the dollar crisis."

One test applies to the British: Is Britain making an honest effort to re-establish itself as a real competitor in world markets?

The other test applies to us in the United States: Are we willing to see Britain re-emerge as a strong competitor in world markets—even in our own home market—and to help her do so?

Today, even though both countries have faced the devaluation test, the answer to these questions probably is no.

I

The situation we face is, in fact, unprecedented. In every important industrial country of the non-Communist world, except Germany and Japan, production is above prewar volume, thanks largely to the Marshall Plan. Yet trade between nations is shackled as it has never been since the 18th century. And the shackles grow day by day. What is worse, two distinct trading areas—the dollar area and the sterling area—have grown up in the non-Communist world, and the gulf between them grows wider.

What kind of leadership have the United States and Britain had in the face of this crisis? President Truman late in August wisely checked the trans-Atlantic bickering over the dollar crisis. *But Mr. Truman showed no awareness of the basic question that the American people must soon decide: Is the United States able and willing to generate trade between nations, as Britain did in the 19th century?*

What have British leaders offered us? Foreign Secretary Bevin and Chancellor Cripps called their September visit to Washington "one of the most important missions in history." *But they did not tell the British people, and perhaps do not admit themselves, that their Labor government must change its internal and external policies if Britain is ever to earn its living in a competitive world.*

Admittedly, the problem Britain has faced since 1945 is a colossal one. But, in the face of its grave difficulties, what has Britain done? The working day was shortened. Welfare economics have run riot. High taxes have sapped incentives. Labor and capital have clung to their prewar psychology of cartels and featherbedding. Government controls and government trading have hamstrung private initiative. Nationalization schemes have injected politics into the struggle for industrial recovery.

Thus the policies of the Labor government have made Britain's adjustment to its new position in the world immensely more difficult. But Americans who attribute the danger of an international breakdown to British socialism greatly oversimplify the problem. Virtually every country in the world, socialist or not, faces the same dollar crisis that Britain faces.

continued on next page

We Americans must recognize that our economic strength unbalances world trade as does Britain's weakness. World War II increased America's superior power to produce goods. It also made the United States more self-sufficient. Thus, while the world demand for American goods has risen, our demand for foreign goods, except for basic raw materials, has not increased. Today we sell more to every major area of the world than we buy from it—and yet we wonder why there is a dollar crisis.

It is time for us to recognize that there are two fundamentally conflicting pressures at work in the United States. One is our desire for a big surplus of exports over imports. The other is our desire for a system of free-wheeling trade around the world. We can not have both unless we as taxpayers wish to subsidize our exports. Which do we want?

Curtis E. Calder, chairman of the International Relations Committee of the National Association of Manufacturers, says, "The battle of the foreign trade gap is essentially that of reconciling our urge to export our surpluses with a reluctance to accept imports in payment for them . . . The dilemma is an uncomfortable one to face."

II

Here, then, are the basic questions that confront men in Washington and London. Does Britain really want expanding world trade or a high-cost welfare state? Does the United States really want expanding world trade or a huge surplus of exports? So far politicians in Washington and especially in London have ducked these issues because they are political dynamite.

If the people of Britain decide they want to regain their position as a competitive trader in expanding world markets, here are specific objectives that men in London should set for themselves:

1. Lower government costs. The British Treasury has asked for cuts of 5% in 1950. But a cut nearer 15% will be necessary, even if that means fewer government subsidies and health services. Enterprise will never revive nor costs come down while taxes take 40% of the British national income, including roughly 60% of business profits.

2. Fewer government controls. Only by removing controls and allocations (except on a few necessities) can Britain begin to return to prices fixed by competition rather than by government fiat.

3. Stronger anti-monopoly legislation for both business and labor. Britain needs a concerted drive against all forms of restrictive, high-cost practices. This drive should put teeth in the anti-monopoly act and supplement it with legislation to end restrictions imposed by trade unions.

4. Less restrictive trading practices. Britain should retreat gradually from its international barter between governments if competition is ever to have free play in international trade.

Meanwhile, if we of the United States sincerely want multilateral world trade, men in Washington must face up to four problems and hammer out workable solutions:

1. Use of the International Monetary Fund to back a devalued pound. In time the Fund, in which we have the controlling voice, might be used to promote convertibility of pounds into dollars.

2. Help for Britain in meeting war-created external debts. This might mean support for London in getting a reduction of the war debts Britain owes India, Pakistan and Egypt, for example. To achieve such a debt reduction for Britain we might have to underwrite a part of a Southeast Asia recovery program.

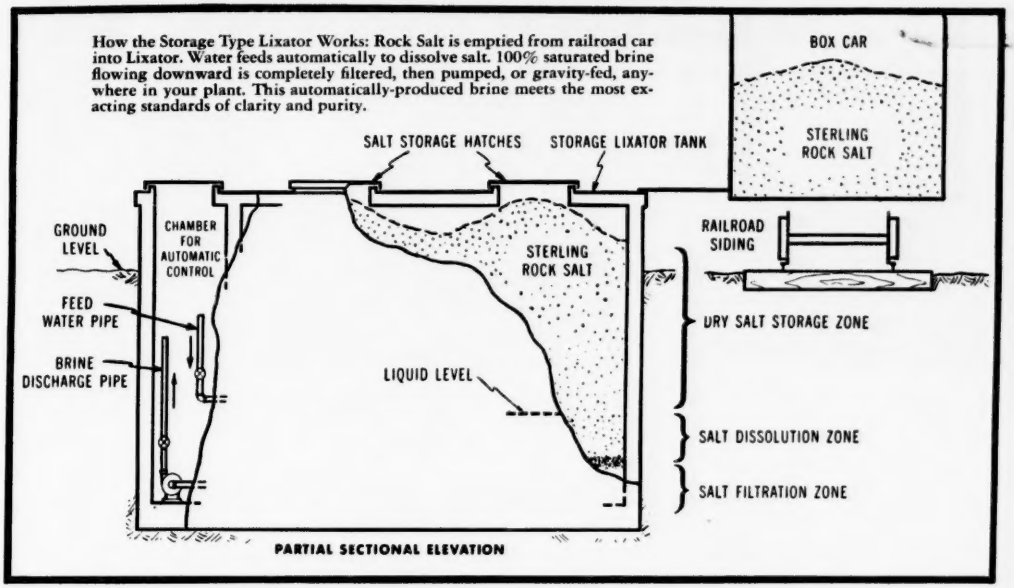
3. Encouragement of American investments abroad. Such investments should be directed primarily into enterprises which will earn dollars, such as the development of new sources of raw materials, or which will raise productivity abroad.

4. Our own tariff barriers. Our attitude toward this critical issue will be the acid test of how deeply we believe in the merits of free world competition.

If we really want free, competitive trading between the people of the world, these issues must be met and resolved by leaders on both sides of the Atlantic. If we do not want to face these issues, then let us resign ourselves to a world walled off into three trading areas: the Communist bloc, the sterling area, and the dollar area. So far, Washington and London have muddled along, except in facing the devaluation problem. Clarity and courage are still needed.

President, McGraw-Hill Publishing Company, Inc.

THE STORAGE TYPE LIXATOR*


How the Storage Type Lixator Works: Rock Salt is emptied from railroad car into Lixator. Water feeds automatically to dissolve salt. 100% saturated brine flowing downward is completely filtered, then pumped, or gravity-fed, anywhere in your plant. This automatically-produced brine meets the most exacting standards of clarity and purity.
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STERLING ROCK SALT
SALT STORAGE HATCHES
STORAGE LIXATOR TANK
GROUND LEVEL
CHAMBER FOR AUTOMATIC CONTROL
STERLING ROCK SALT
RAILROAD SIDING
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LIQUID LEVEL
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PARTIAL SECTIONAL ELEVATION

Provides Brine in Great Volume with MAXIMUM EFFICIENCY AND ECONOMY *to Lower Production Costs*

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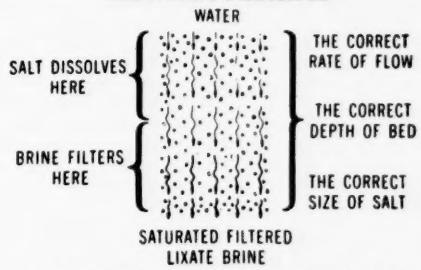
THE LIXATE PRINCIPLE



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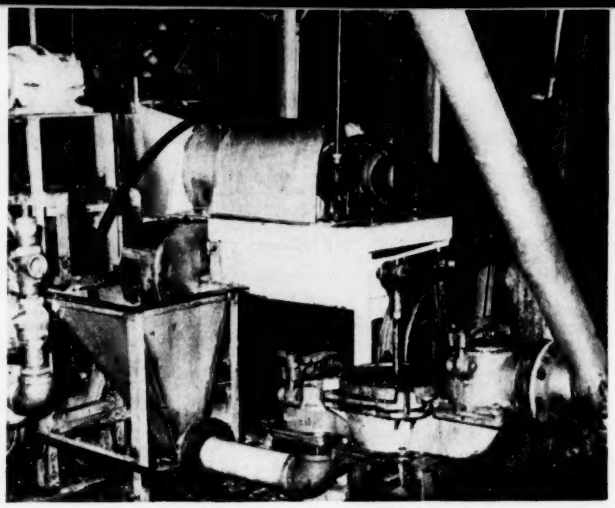
The **LIXATE** *Process*
REG. U. S. PAT. OFF.
for making brine

INTERNATIONAL SALT COMPANY, INC.
*Trade Mark **Scranton, Pa.**

1 **FLUMES** convey tomatoes from trucks to the special soaker-washer.



2 **DICERS** cut green tomatoes into small pieces, then discharge them into stream of water. Diaphragm pump (right) picks up mixture.

Making Chili Sauce Relish

Improved Equipment and Process Up Product Quality, Operating Efficiency

CHILI SAUCE RELISH is made from end-of-season products—green tomatoes, sweet red peppers and onions—plus vinegar, sugar syrup and seasoning. Although this product is a relatively new one at the P. J. Ritter plant in Bridgeton, N. J., numerous processing changes have been made, and new equipment designed, to improve product quality and operations.

Two separate production lines are operated to prepare the main components. These lines merge at the cooking kettles, where the other ingredients are added and the finished product is prepared.

Green tomatoes are unloaded from farmers' trucks into flumes—as depicted at Point 1 in the flowsheet—which convey them to a new type of soaker washer designed by Ritter engineers. This machine eliminates the elevator and squirrel-cage washer formerly used. It consists of a bronze roller chain conveyor which picks up tomatoes from the soaker tank and revolves them as they move up a slight incline. Small sizes and pieces pass through the rolls and flow to the sewer.

After 25 ft. of inclined travel, the conveyor levels off to form a primary inspection table. It then passes through a spray washer and emerges at a second inspection table. Inspection is facilitated by the constant rotation of the tomatoes as they move along the conveyor. One major advantage of this new machine is that it is self-cleaning.

After passing a third inspection and trimming table, the green tomatoes go through a dicer. Final inspection is given the diced product as it discharges from the conveyor in a stream of water. Then a diaphragm pump moves the water-suspended dice to wood storage and aging tanks.

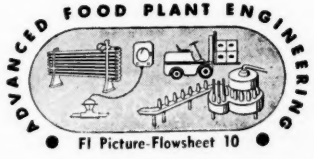
Sweet red peppers in lug boxes come to the plant palletized, 30 lugs to the pallet. Industrial power trucks unload farmers' trucks and transport the pallets to the pepper processing line. Lug boxes are hand-dumped onto conveyors for inspection and sorting. A soaking-washing operation is next, followed by pod crushing between rollers. This releases the seeds, which are removed in a rotary screen spray washer. Two further inspections and one more washing follow. The peppers are then diced (Point 6).

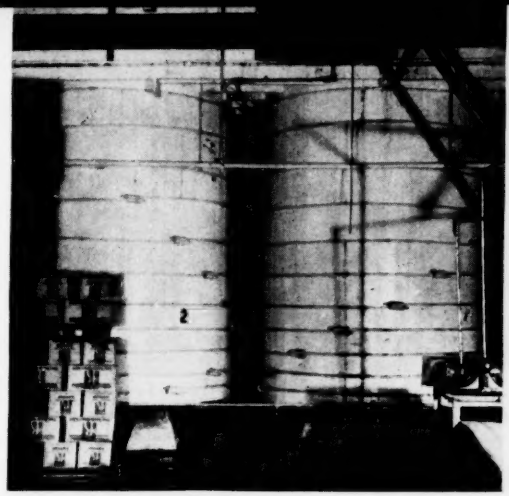
Diced peppers are elevated by a screw conveyor and discharged in a stream of water. They are then pumped in suspension to a dewatering screen which empties into the cooking kettles. Green diced tomatoes are pumped from the wood holding and aging tanks to the same dewatering screen.

The dewatering screen travels on a tramrail (Point 7) so that it can discharge into any one of the 16 cooking kettles. After the desired quantities of tomatoes and peppers have been measured into a kettle, vinegar and sugar syrup are metered in, and the other ingredients added.

When cooking is completed, the relish is emptied from the kettles into a holding tank which supplies the jar filler as needed. Filled jars are capped, cooled in a fog spray cooler, dried, labeled and automatically cased, ready for storage or shipment.

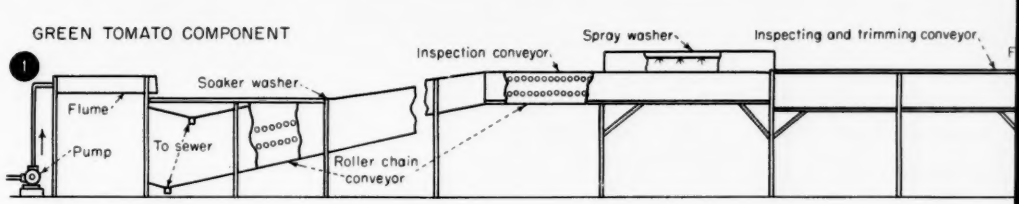
FOOD INDUSTRIES October 1949 Pages 92-95

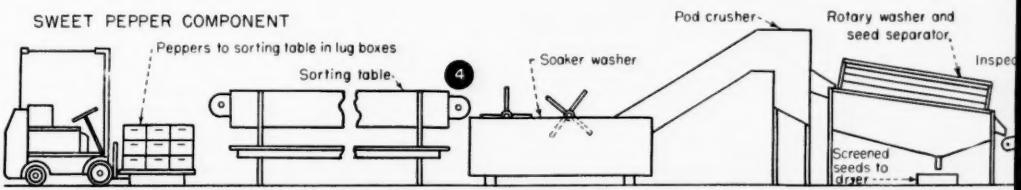




3 **WOOD TANKS** receive cut-up tomatoes from dicers, store them until needed for processing into chili sauce relish.

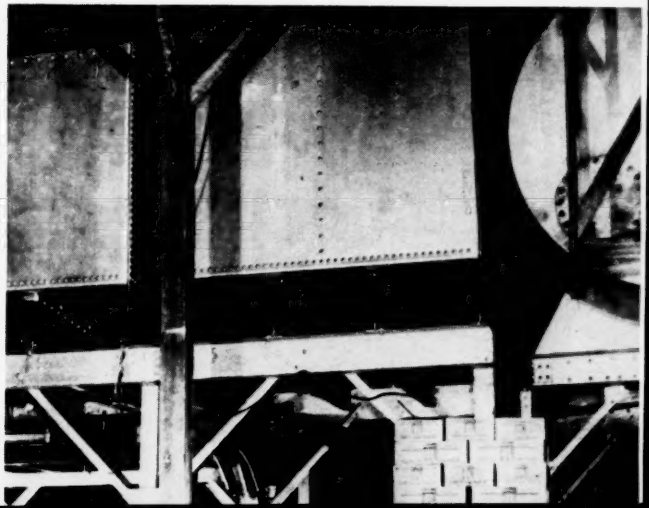
4 **SOAKER WASHER** receives peppers from trimming and inspecting table. Paddle then moves peppers forward.

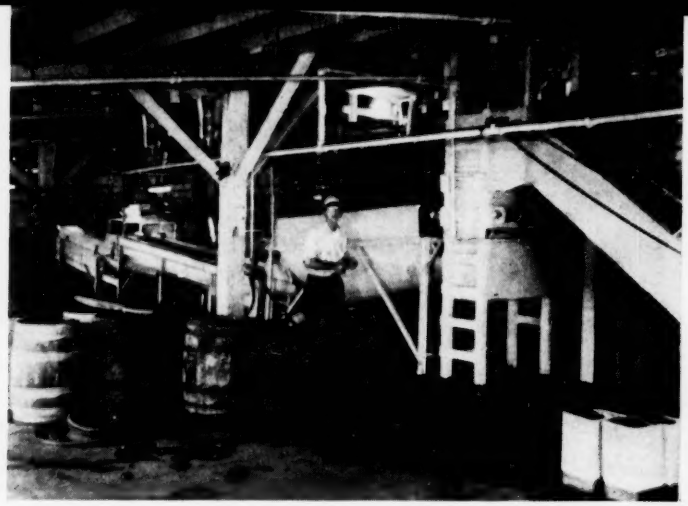




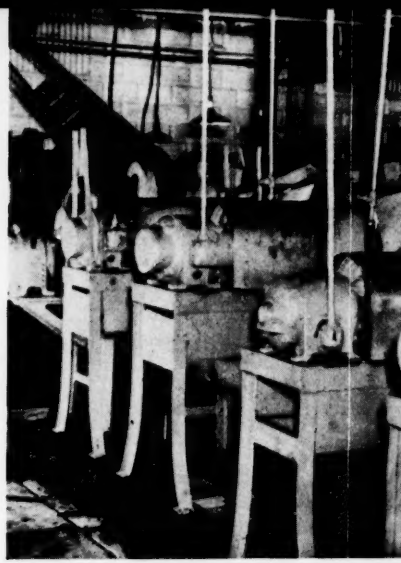
8 **LIQUID METERS** automatically measure vinegar and sugar syrup into each kettle.

9 **STEEL TANKS** for storage of sugar syrup are mounted near ceiling to allow maximum use of floor space for storage of raw and finished products.

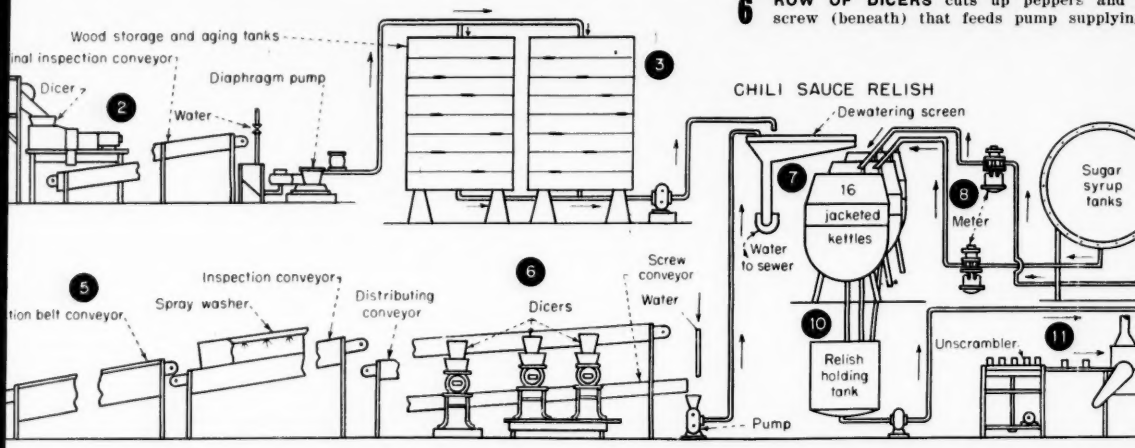




5 **POD CRUSHER** (right) releases seeds from peppers, then rotary separator (center) separates them and discharges pods onto inspection conveyor (left).

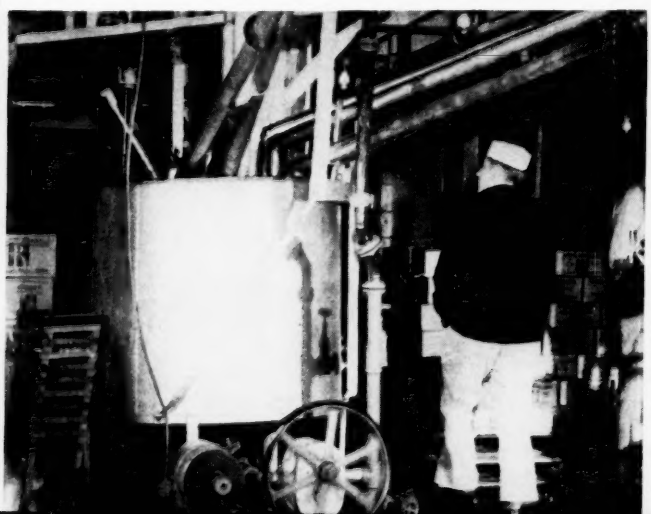


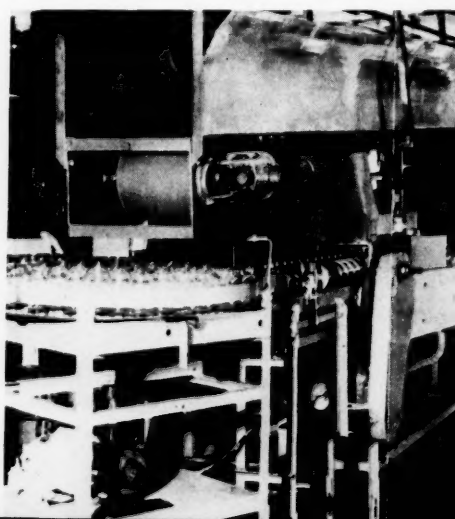
6 **ROW OF DICERS** cuts up peppers and screw (beneath) that feeds pump supplyin

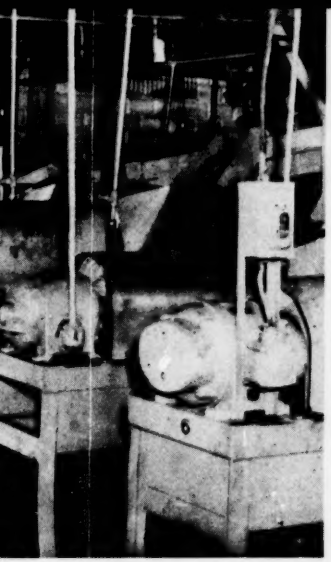


10 **TUBING** of stainless steel is used to convey finished relish from kettles to intermediate holding tank from which it is pumped to jar filler.

11 **UNSCRAMBLER** (left) takes glass jars as em and feeds them in single line through preheater (c

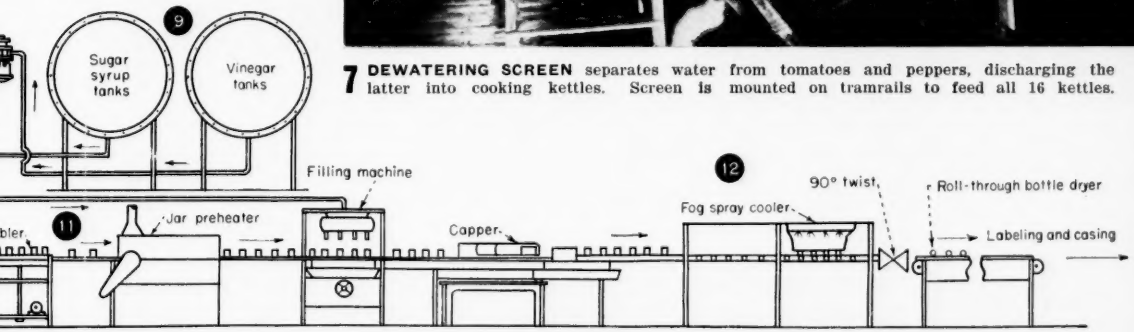






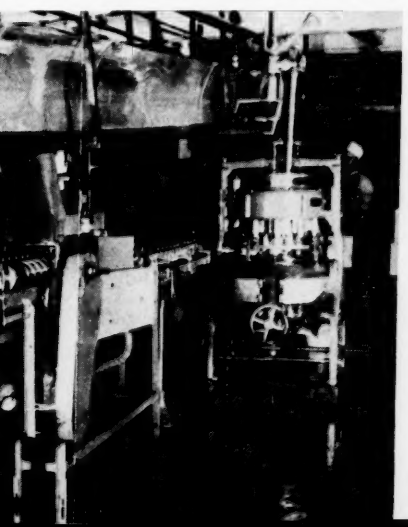
up peppers and discharges them into
s pump supplying the cooking kettles.

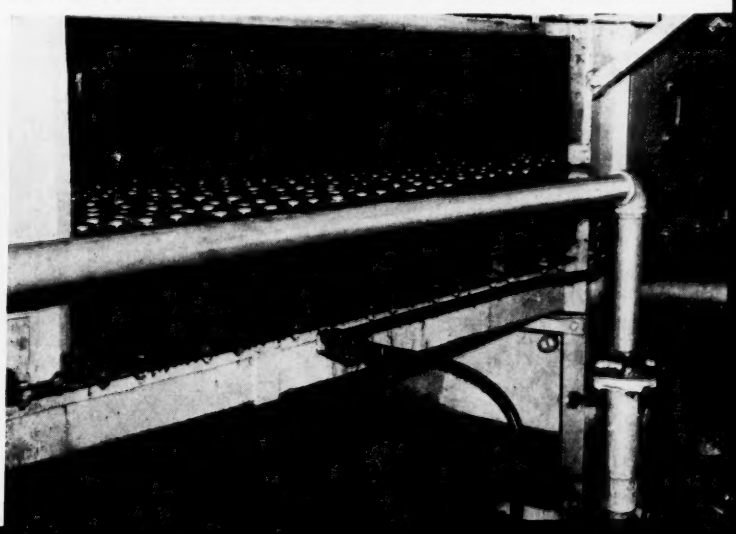
7 DEWATERING SCREEN separates water from tomatoes and peppers, discharging the latter into cooking kettles. Screen is mounted on tramrails to feed all 16 kettles.

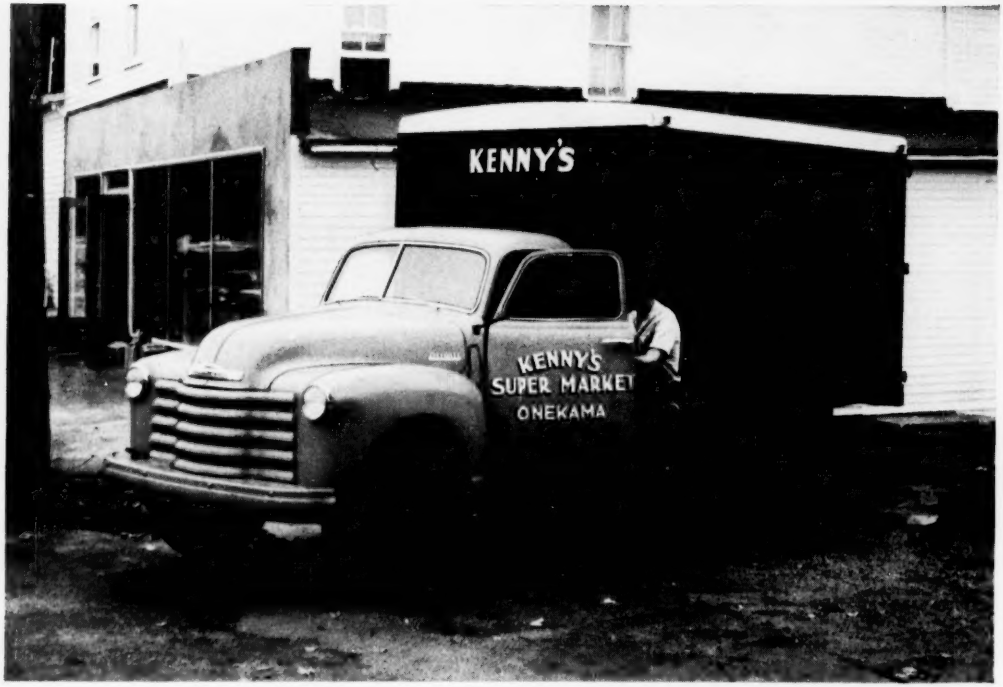


glass jars as emptied from cardboard containers
ough preheater (center) to filling machine (right).

12 FOG SPRAY COOLER sprays cold water onto closed jars of relish as they are conveyed slowly through enclosed chamber. Cooled jars go directly to labeler.







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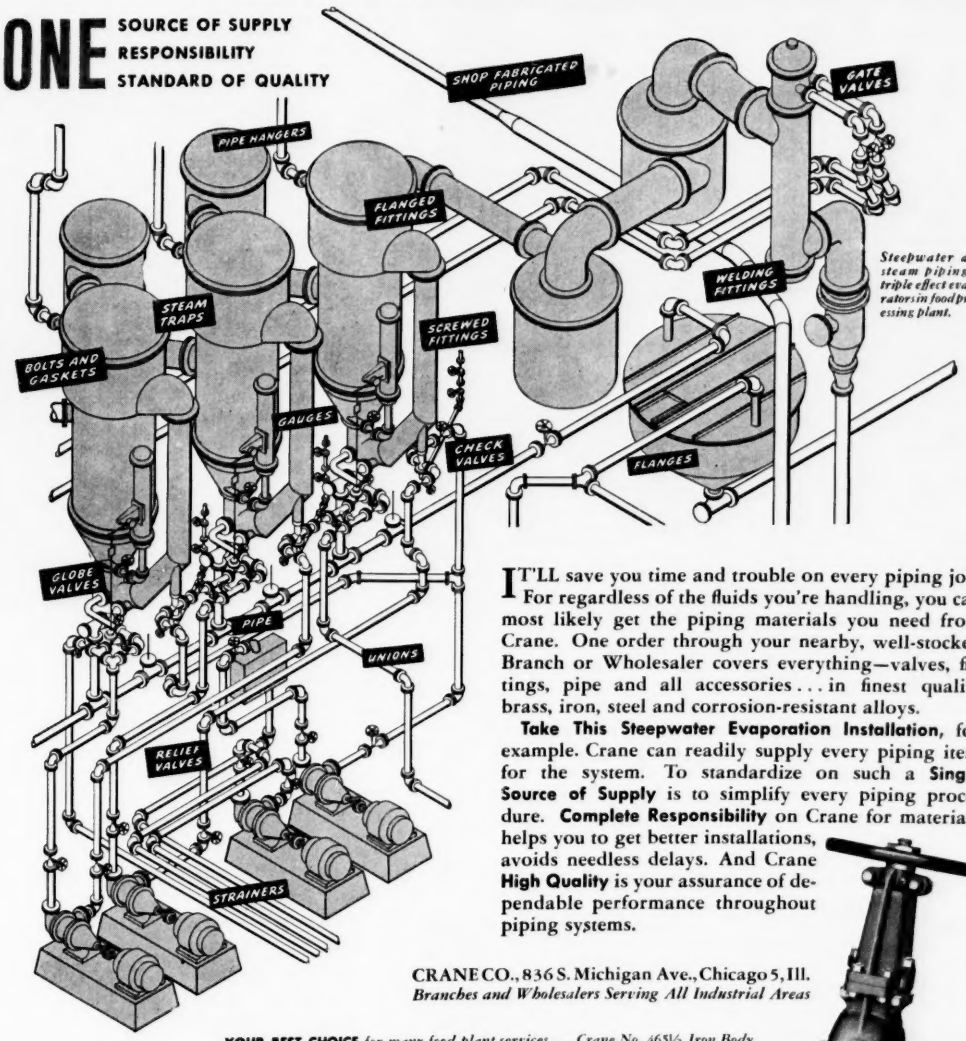

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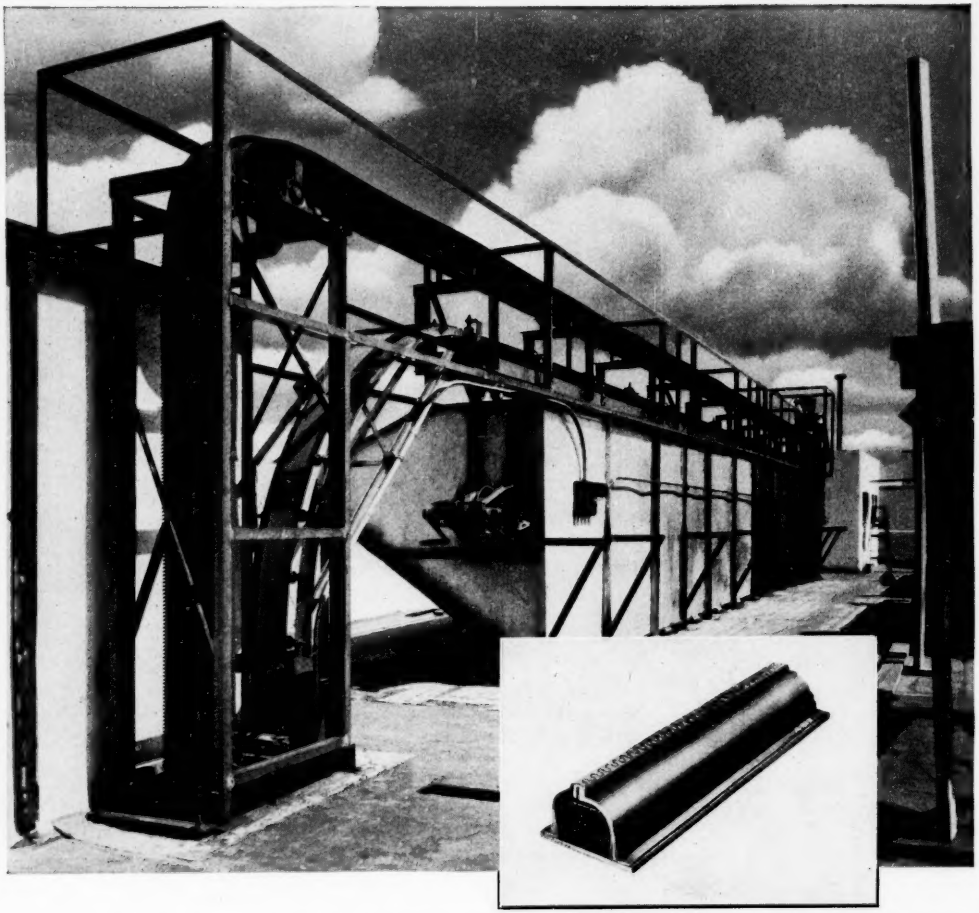

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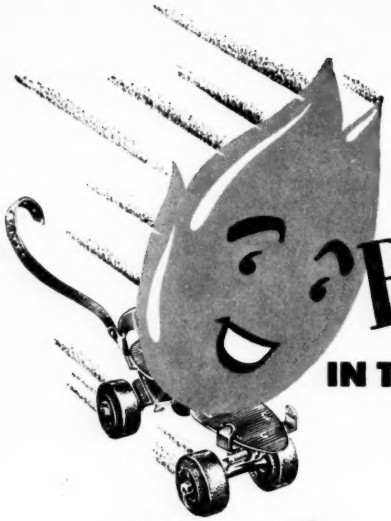

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In combination, these industry-leading feats have, for comparatively nominal investments, pulled down B. T. U. costs for many a plant by eliminating needless and costly waste. This applies not only to first-time users of exchangers, but long-time users as well who are now finding that adding Ross equipment pays off...*quickly!*

Ross Heater & Mfg. Co., Inc., Div. of American Radiator & Standard Sanitary Corp., 1443 West Ave., Buffalo 13, N. Y. In Canada, Horton Steel Works, Ltd., Fort Erie, Ont.

★ Whether or not you have made a recent heat consumption survey, why not consult a Ross heat exchanger engineer now? No obligation in finding out from him how to increase the B. T. U. return from every fuel dollar you spend.

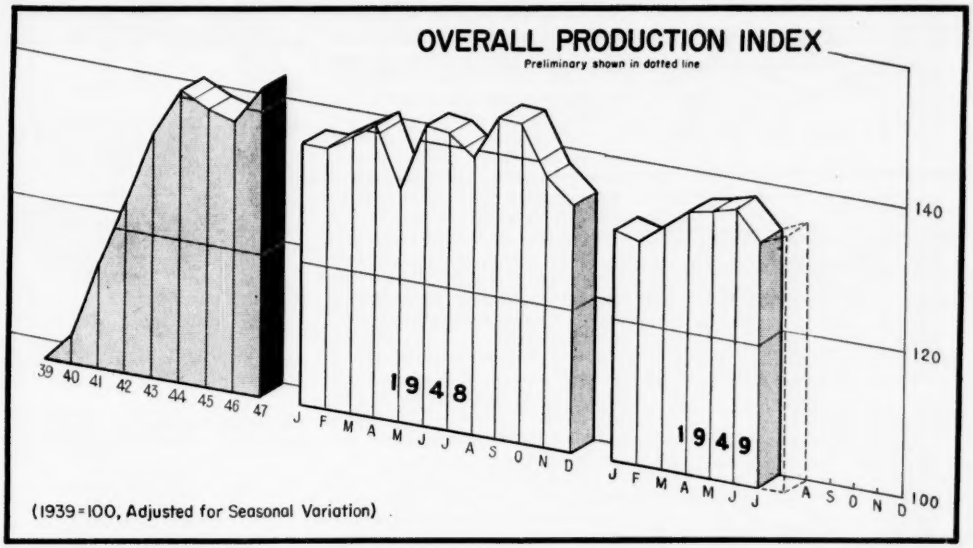
ROSS

EXCHANGERS ...*MAKE OTHER PRODUCTS BETTER*

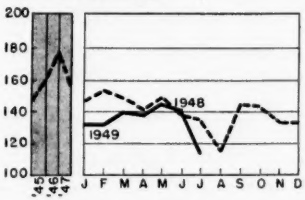
Serving home and industry

AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILER • ROSS HEATER • TONAWANDA IRON

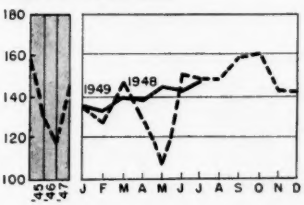
Food Industries Index



Canning Dips Sharply



Meat Packing Ascends



Latest Industry Figure Shows Increase Despite Dips in Canning and Baking

FOOD PRODUCTION recovered slightly in August after dropping in July. Final figure for July was 134 and the preliminary for August, 136. In comparison, June's index stood at 138.

Canning, one of the largest food industries, dropped sharply to pull the overall July index down. The seasonally adjusted canning index was off 19 percent from June and 16 percent below July, 1948. Baking, another large component of the overall index, was down 4 percent from June and was slightly below a year ago. Meat packing topped June activity by 2 percent, but was lower than in July, 1948.

Although the July canning figures show a drop in activity, a large pack is still forecast. A somewhat later start in canning operations can distort the monthly picture at this early stage. But for the season as a whole, the vegetable pack should come close to last year. And the fruit pack should be as large or larger.

Here are the latest forecasts made by the Department of Agriculture: Peas, about the same as last year, and beans, up some. Less corn will be canned than in 1948, when farmers produced a mammoth corn crop. But the corn pack will still be large compared to that of most years. Plantings of tomatoes for processing were considerably reduced this year because of heavy inventories of canned tomato products. So tomato canning will show quite a drop. Of the fruits, apple, applesauce and pear packs will be larger. Apricots, sour cherries and fruit cocktail will be smaller.

The outlook for meat packing is very strong. The Department of Agriculture predicts a large rise in the meat supply during the remainder of this year. The spring pig crop, which was 15 percent bigger than in 1948, is coming to market. That means a substantial rise in pork production. Beef slaughter should also hold up well. On August 1, there were 24 percent more cattle on feed in the corn belt than at the same date last year. Increased supplies of grain-fed cattle, at heavier weights than range cattle, will compensate for decreased slaughter of calves and cows, more of which are being retained on farms.

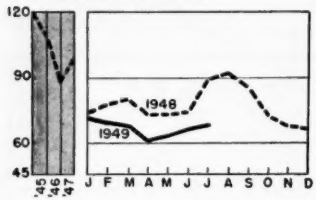
If output in the canning and meat packing fields rises as forecast, total processed food production for the second half of 1949 will come close to

At a Glance—

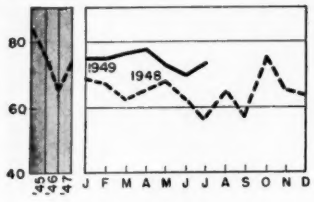
(1939 = 100, With All Figures Adjusted for Seasonal Variations)

	July 1949	June 1949	Percent Change	Year Ago
Baking	140	146	—4.1	142
Beverages	166	159	+4.4	175
Butter	73	70	+4.3	56
Canning	114	141	—19.1	136
Cereals	167	145	+15.2	162
Condensed Milk	174	170	+2.4	162
Confectionery	110	102	+7.8	131
Flour	127	124	+2.4	140
Ice Cream	174	176	—1.1	176
Malt Liquors	166	156	+6.4	182
Margarine	274	289	—5.2	241
Meat Packing	147	144	+2.1	150
Sugar, Beet	71	65	+9.2	111
Sugar, Cane	68	67	+1.5	90

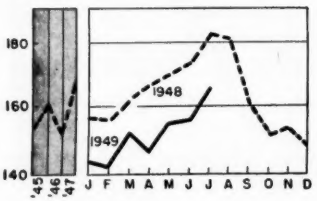
Cane Sugar Keeps Rising



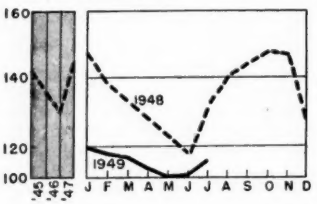
Butter Better



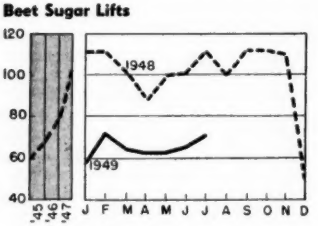
Malt Liquors Still Climb



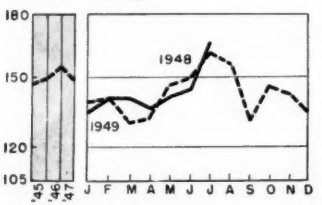
Candy Shows Increase



Beet Sugar Lifts



Cereals Much Higher



1948 figures. Since 1944, overall production, as measured by our FI Index, has fluctuated rather narrowly around a level of 140 percent above 1939. This seems to be the level of production that satisfies the food demand of our present population. Over a long period, of course, total production must rise as population increases and as higher incomes permit higher per capita consumption. But for the near term, our index is not likely to go considerably above or below the 140 level.

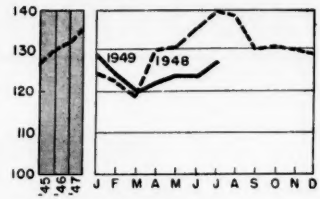
Food production did take an exceptional drop—the sharpest since the war—between November, 1948, and February, 1949. And it was slow picking up in the spring months. Main reason was that distributors were drawing down their inventories instead of ordering from processors. On June 30, grocery wholesalers had on hand only 43 days' supply of food products, whereas on January 30 they held 52 days' supply. Inventories were worked down steadily, even though sales volume was rising.

This was an abnormal situation, and restocking has evidently been taking place. Our FI Index averaged only 132 for the first quarter of 1949. But it averaged 136 for the second quarter and may rise to 138 for the third quarter, heading back toward the 140 level. How high the overall Index will actually go depends largely on the size of the canning pack, which is still not finally determined.

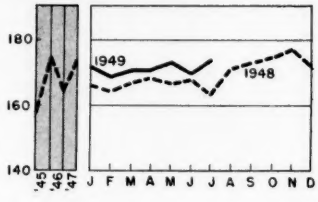
Chances for a steadily rising level of food production have been increased by the general comeback in all lines of business. Employment in industry has risen sharply, which means that more workers can spend freely on food. At the same time, the improved general outlook should stimulate confidence and new orders by wholesalers and chain stores. In fact, this probably accounts for the restocking that has taken place so far. One reason inventories were cut was the fear that widespread unemployment would lead to lower retail food prices. Actually, retail food sales in the latest months reported topped last year in physical units. Moreover, the past tendency has always been for food sales to stay fairly well up in terms of units, even when consumer buying power fell off.

There is, of course, one unknown factor in the food production picture—exports. It is still not clear how much the foreign dollar shortage, particularly in Britain and other sterling area countries, will cut down their imports of processed food. Effects of the devalued pound are something to consider as is the amount of American aid that may be extended to these countries and how much will be allocated for the purchase of American food products.

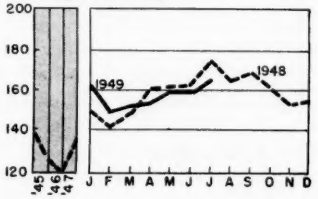
Flour Edges Up



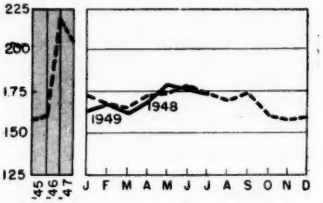
Condensed Milk Rises



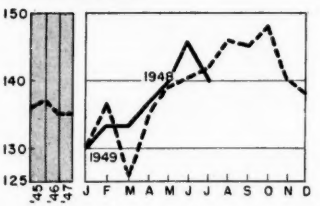
Beverages Move Up



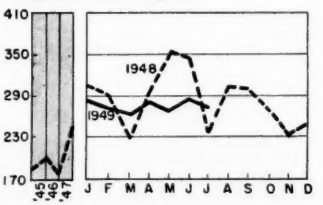
Ice Cream Droops



Baking Cuts Back



Margarine Down Again



Now! a permanent non-electric magnetic drum separator

Developed by *Eriez*

Magnetic drum element above can be ordered separately. Shaft diameters are standard to permit replacement in existing installations without changing bearings or shaft mountings. Ordinarily installed at discharge end of gravity flow chutes, spouts, or other conveyors.

Available in a variety of sizes, 12", 18" and 24" diameters. Utilizes a reverse feed which eliminates glancing. Adjustable check gate regulates and evenly feeds material. Shell rotates on sleeved precision ball bearings, completely sealed in a dust proof mounting. Unit is fully enclosed, fully automatic and of all metal construction.

Available in 12" diameter x 14" width. Adaptable for majority of installations. Bearings are same as df 101 drum. Adjustable check gate regulates and evenly feeds material. Drum and housing are furnished ready for installation. Unit is fully enclosed, fully automatic and of all metal construction.

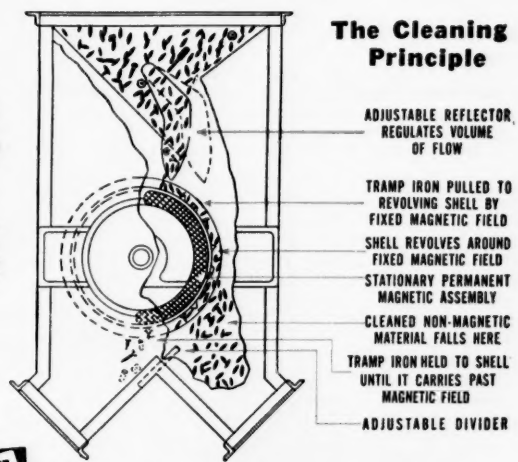
"See our exhibit at the 22nd Exposition of Chemical Industries, Grand Central Palace, New York —November 28 to December 3, 1949"

AFTER two years of field testing in every industry, Eriez offers industry this completely new, revolutionary magnetic drum type separator. Self-cleaning, and powered by permanent non-electric magnets, the Eriez separates ferrous materials at far lower cost. There's no operating or maintenance expense . . . no need for current or wiring . . . you get safe, spark-proof reliable magnetic protection right around the clock. There's nothing to get out of order—no attendant electrical accessories . . . the powerful magnetic field of the Eriez is Permanent and magnetic separation is amazingly simple. A look at the diagram below shows how it's done.

AUTOMATIC FERROUS METAL SEPARATION FOR:

Powders	Sand	Minerals
Chemicals	Tobacco	Fertilizers
Grain	Explosives	Metals
Plastics	Crumb Rubber	Textiles

The Cleaning Principle



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ERIEZ MANUFACTURING COMPANY

101 East 12th St. • ERIE, PA.

New Packages and Products

Cheese Now Sold In Flexible, Vacuum Packs

Natural Swiss cheese, vacuum-packed in a flexible plastic envelope, was recently introduced by Ryser Bros., Chicago, It is credited with being the first package of its kind on the market.

Tradenamed Ryco Swiss, the Wisconsin-made cheese is aged 60 days. The novel sales-appealing pack offers the food sliced and ready to serve, with rind removed and with flavor sealed in.

Pack has net weight of 8 oz., is colored red and yellow, and has a clear window for visibility of contents. Standard Cap & Seal Corp., Chicago, produces the new package, which has the registered tradename, Flexvac.

Coffee Packed In Bags for Single Service

For consumers wanting a speedy, convenient cup of good java, there is now offered individual-cup coffee bags, tradenamed "Steepolator."

The pure ground coffee is packed in bags like the familiar tea bags. Simply dunking the bag into a cup of hot water for the desired steeping time will give the individual a "custom-made" drink to his taste.

After six years of experimental work, the processor, Per Cup Coffee Corp., Boston, developed the machinery and procedure for packaging the ground coffee so as to preserve its full-bodied flavor. Machinery as well as the special bags are patented by the firm.

Filled with precisely measured amounts of 100 percent pure ground coffee, the bags are vacuum packed 20 to the jar. Manufacturer is making the packaging facilities available to all private and national brand coffee companies.

Surveys to determine consumer acceptance of this method of coffee preparation were made in the Boston area. Of the questionnaire cards returned by mail, 79.6 percent responded as liking the new way. Over 65 percent of these especially enjoyed the convenience, 48 percent liked the true flavor as well as speed of preparation, and 41 percent appreciated not having to wash a pot.

Looking back at the very rapid rise in popularity of tea bags, now used exclusively by many housewives who no longer wish to bother with loose tea, the processor hopes for the same acceptance with these convenient coffee bags.

Sugar "On-View" In Cellophane Parcels

Individual servings of fine granulated sugar have been introduced by Spreckels Sugar Co., San Francisco, in attractive cellophane packets.

These new containers are now in use by hotels, restaurants, drive-ins, and hospitals on the West Coast. Their sanitary, labor-saving, and ease-of-handling aspects make them especially convenient for institutional use.

Each serving contains ¼ oz. of sugar, equivalent to a heaping teaspoonful. The plastic parcel is 1⅜ in. wide by 3 in. long (including the sealed ends). The words, "Spreckels Sugar," are printed in red on both sides of pack. Heat-sealed ends have red and blue polka dot design. Edges are "pinked" for easy opening.

This sugar is sold in 25-lb. containers, each holding about 1,600 servings.

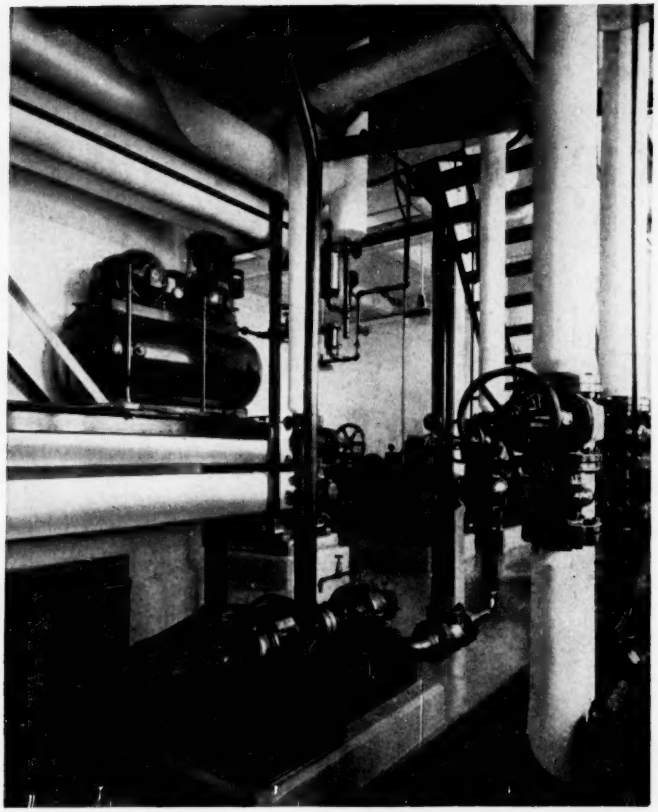
(Packages and Products Cont'd)

WHICH CAP WILL HELP MOVE THE PRODUCT?

GOOD CAP DESIGN can be an important factor in moving your product off the store shelves. An attractive cap design, in sparkling color, stops shoppers' selective eyes—creates more impulse sales. This "before and after" illustration shows how Armstrong's expert package designers can put a colorful design that sells on a plain metal cap. And Armstrong can do the same for you. For just a fraction of a cent per cap, an attractive design can be added in color. For design suggestions, send a sample package and complete market data to Armstrong Cork Company, Glass and Closure Division, 4210 Prince Street, Lancaster, Pennsylvania.

Armstrong's Closures

TURN STANDARD CONTAINERS INTO STANDOUT PACKAGES



Pratt & Whitney's 14-mile K&M insulation starts here. It's fit for the job and looks fit!

Where K&M "*Featherweight*"® 85% Magnesia

Keeps up steam...keeps down cost...for 14 miles

Pratt & Whitney Division of Niles-Bement-Pond Company, West Hartford, Conn., has long been noted for fine machine tool, cutting tool and precision gauge manufacture. The scientific attitude is a Pratt & Whitney habit. They applied it to saving b. t. u.'s along 14 miles of steam lines throughout their large power plant and shops. That led them to use K&M "Featherweight" 85% Magnesia pipe insulation for maximum efficiency and permanence.

The inherent insulation effectiveness of K&M "Featherweight" 85% Magnesia comes from basic Carbonate of Magnesia. This is combined with clean Asbestos Fibre in correct proportion for needed weight-saving strength. Therefore it is easy to do a fast, shipshape insulation job whose continued efficiency does not depend on costly maintenance.

Designed for temperatures to 600° F., K&M "Featherweight" 85% Magnesia comes in all standard sizes. Like the other K&M insulation materials, it can save you waste—difficulty—money. Get help on any points by consulting your nearest K&M Distributor—an insulation expert.

Nature made Asbestos...
Keasbey & Mattison has made it serve mankind since 1873

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CHICKEN CROQUETTES
Ready to shape & fry
INGREDIENTS: CHICKEN, CHICKENSTOCK, BREADCRUMBS, MILK, FLOUR, ONIONS, CELERY, SALT, AND SPICES.
NET WEIGHT - 1 POUND 4 OZ.
CHICKEN CROQUETTES IS "GOOD!"
TRULY, A DUTCH TREAT
MAKES 8 LARGE CROQUETTES.

Oldtime Amish Treats in Cans

From a modern food plant built on a farm along the Susquehanna River in the Dutch country of Pennsylvania, has recently come Meeting House Brand Chicken Croquettes—a special product cloaked in a self-selling label.

Made according to an old Amish recipe, the mixture contains chicken, chicken stock, bread crumbs, milk, flour, onions, celery, salt and spices. Contents are ready to shape and fry. The tin has a net weight of 1 lb. 4 oz. of the product—enough for molding eight large croquettes.

Much of the success of this new item in specialty stores throughout the country is justly attributed to its colorful, strikingly-gay wrapper. This was designed by Kenneth Fertig after he decided, a few months ago, to take one of his grandmother's recipes and go into the food business.

Using a group of typical oldtime Amish illustrations of plump-faced girls and bearded men, hex signs, and flowers, he has created something decidedly different. And it seems to do the job.

Dollar Sales of Penny Items

Printed in shiny black on orange stock, the "Trick or Treat" package of Pearson Candy Co., Los Angeles, affords dealers a profitable, special pack of lollipops.

Box is wrapped in clear cellophane to make a clean, eye-catching display. Individual candies are wrapped in a variety of brilliant colors of cellophane to correspond to a variety of flavors.

The package, filled with 100 of the firm's top-quality suckers, is credited with taking the small penny item and turning it into a profitable seller. Dan Pearson designed the container, which is manufactured by Eureka Paper Box Co., Los Angeles.

Tea With a Victorian Blend

An imported blend of choice, delicately flavored Ceylon, India and Formosa Oolong teas, is now being offered by General Foods Corp. in attractively lithographed tins wrapped in cellophane. Labeled "Ridgways H. M. B. (Her Majesty's Blend) Tea," the product is retailed through the finer specialty food stores.

H. M. B. tea was originally produced more than 60 years ago by Ridgways, Ltd., London, to meet the exacting requirements of the late Queen Victoria.

Because of the select appeal of the tea, it is being sold directly to the retail trade by GF's Maxwell House division.

(Packages and Products Cont'd)

Why risk uncooked Food?

Use ATI COOK-CHEX

BATCH No.
RETORT No.
ATI COOK-CHEX

No Error!

Simply place an ATI Cook-Chex retort tag on each basket before cooking. When tag turns green, you *know* the food is fully cooked.

No Worry!

ATI Cook-Chex retort tags are unfailingly accurate. They guarantee you against human error. They safeguard consumer good-will and company profits.

No Loss!

ATI Cook-Chex prevent waste or spoilage, and they cost so little. Less than 1/50¢ per case.

THESE LEADING RETORT CANNERS USE ATI COOK-CHEX:

Burnham & Morrill Co.
California Packing Corp.
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D. E. Foote & Co.
Gerber's Baby Foods
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Grocery Store Products Co.
Hunt Foods, Inc.
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"Super Salesmen for Super Markets"

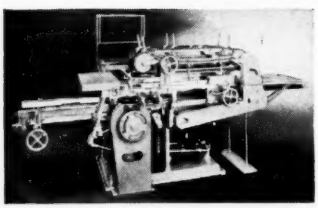
Today's self-service selling makes self-selling packages a "must". You need a smart, colorful, modern package . . . one that stands out in competition!

PACKAGE machines offer you the broad versatility—both in styles of wrapping and in use of materials—that makes such eye-catching wrapping possible. And a complete line of over 80 standard models assures your obtaining the best possible machine to wrap your product.

Moreover, such features as high speed, quick adjustability for many sizes, and simplicity of supervision keep operating costs in line with today's need for production economy.

Discover for yourself why America's leading packaged-goods producers consistently choose PACKAGE machines. Consult our nearest office today.

Write for our leaflet "Packages that Sell"



Model FA. An extremely versatile machine suited to a wide variety of products.

Over 80% of America's machine-wrapped goods are wrapped on "PACKAGE" machines

PACKAGE MACHINERY COMPANY

SPRINGFIELD 7, MASSACHUSETTS

NEW YORK · CHICAGO · BOSTON · CLEVELAND
ATLANTA · DALLAS · DENVER · LOS ANGELES
SAN FRANCISCO · SEATTLE · TORONTO · MEXICO D.F.

Frozen Coffee Makes Debut

One of the latest developments in frozen foods—pure coffee concentrate—was recently introduced in four test market areas by Snow Crop Marketers, Inc., New York.

Contents of the 6-oz. can makes about 30 cups of beverage. Preparation consists merely of adding a teaspoon of concentrate to a cup of boiling water. It can also be mixed with cold water for making iced coffee.

According to tests made thus far, the company feels that this new item offers all the quick conveniences, while giving the consumer superior flavor and aroma.

Like any true frozen food, it should be stored in frozen food cabinets. Once opened, the concentrate will stay good, in home refrigerators, for about the same period as other instant types frozen goods when opened.

Manufacturer is prepared to begin national distribution if more extensive tests continue to bring favorable customer response.

Noiseless Popcorn Bags

Rustling and rattling of popcorn bags in movies—the bane of many adults—can now be ended by use of a recently invented soft paper bag.

The novel containers have a soft cloth-like texture. They are porous, and small fry will find they can't blow them up and pop them, or fill them with water for strategic bombing from the balconies.

The noiseless bag was originated by Hi-Land Paper Products Div. of the Grand Bag & Paper Co., New York City. The paper is made by a special

(Packages and Products Cont'd)

. . . because Peppercream, and *only* Peppercream . . . is processed from BLACK PEPPER, and *only* BLACK PEPPER! That's why Peppercream seasons over a billion pounds of America's finest food products annually. Write for information.

PEPPERCREAM

the world's finest pepper product

"Silent Partner in Famous Foods"

WM. J. **STANGE** CO.

(Rhymes with Tangy)

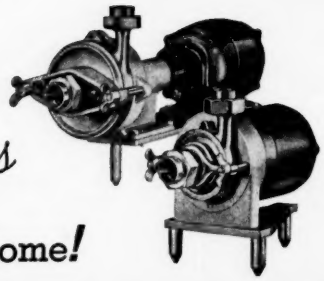
CHICAGO 12, ILL. OAKLAND 6, CALIF.

"Since 1904"

SPECIALTY PRODUCTS

Meet all requirements

and then some!



SPECIALTY
Sanitary
Centrifugal Pumps

Peak performance is the prime purpose of these precision-built centrifugal pumps . . . outstandingly efficient units for food processors. Moving syrups—or other semi-liquids—becomes a cinch because of the three-bladed single piece impeller that won't cause churning or foaming. Beautifully designed, completely sanitary, easy to take apart and clean-up. Ask for interesting Nofome and Streamflo Pump Bulletin 9C.

Sanitary Product-Handling Equipment is a* SPECIALTY *Business

SPECIALTY BRASS COMPANY
Kenosha • Wisconsin

You can "feel" the built-in superiority of SPECIALTY Sanitary Valves and Fittings. Every detail is precisely machined and highly polished to an exacting finish. That's why take-down and clean-up time are a snap. Made from stainless steel or nickel alloy to meet rigid code requirements. Specify SPECIALTY . . . over forty years the leading source of sanitary fittings. Complete details in Catalog 2FB.

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Sanitary **FITTINGS**

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SPECIALTY BRASS COMPANY
Kenosha, Wisconsin

Gentlemen: Please send additional information on items checked below

- ☐ Sanitary Pumps
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- ☐ Sanitary Fittings
- ☐ Stainless Steel Tubing
- ☐ Surface Coolers
- ☐ Economy Filters
- ☐ Milk Bottle Fillers & Coppers

Name.....

Address.....

City..... Zone..... State.....

process by Riegel Paper Corp., New York City.

Marketed under the trade name "Blow-Pruf", more than one hundred million of the new bags have already been used.

Lemonade Now Frozen

Another "newest" among the frozen citrus concentrates—Frozen Fresh Lemonade Concentrate—was recently introduced by PictSweet Foods, Inc., Mount Vernon, Wash.

Test marketing is underway in Philadelphia, Pittsburgh, Houston, Louisville, Los Angeles, San Francisco, Portland and Seattle. Enthusiastic acceptance has been reported.

Contents of the 5-oz. can will make 1 qt. of ready-to-drink lemonade by the addition of water. Each tin contains the juice equivalent of 4-5 ripe lemons. For extra economy, sugar has been added in sufficient quantity to satisfy average tastes.

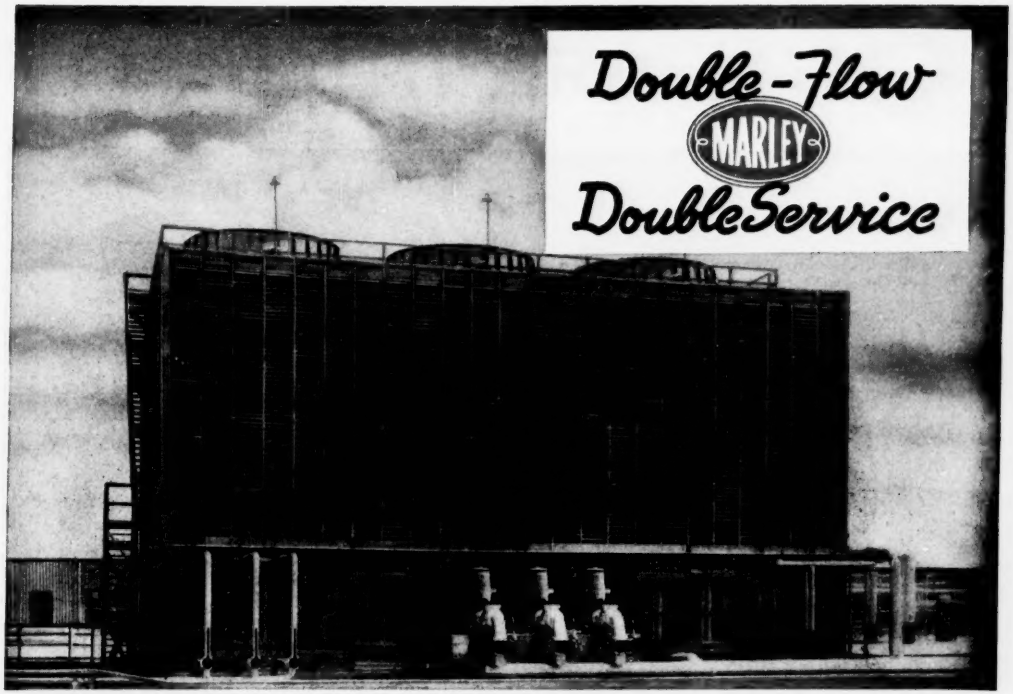
Long considered a "good old summer-time" beverage, availability of this new product in the convenient frozen form is hoped to make it a popular year-round item.

For Finer Machine-Made Donuts

Especially developed as an acid leavening agent for cake-type doughnut flour mixes used in automatic machines, a new type sodium pyrophosphate compound is offered by Monsanto Chemical Co., St. Louis.

The new compound is stabilized for controlled gas evolution so as to give doughnuts an even rate of reaction throughout the baking period. This "tailor made" control is designed to produce light, tender crullers that are round and uniform.

Much of the research and testing leading to the development of the chemical was in firm's new baking lab.



FOR THOSE "*EXTRA TOUGH*" WATER COOLING JOBS

MARLEY DOUBLE-FLOW COOLING TOWERS are built to "Take It"! For unusually heavy water cooling requirements . . . open, closed or combination cooling . . . in any kind of weather . . . and in abnormally corrosive atmospheres, the MARLEY DOUBLE-FLOW is designed to give consistent, around the clock service with a minimum of maintenance time and expense.

This is true because MARLEY DOUBLE-FLOW has these outstanding, exclusive features:

OPEN DISTRIBUTION SYSTEM . . . On top of the tower, in plain view, easy to inspect, regulate and clean.

NO DEAD AIR POCKETS . . . Every drop of water meets a steady flow of air as it splashes down thru Marley's patented nail-less filling.

BETTER MECHANICAL EQUIPMENT . . . Equipped with Marley engineered and Marley made fans, fan cylinders, drive shafts and Geareducers . . . your assurance of top quality.

SOUND STRUCTURES . . . Double-Flows have withstood hurricanes, earthquakes and corrosive atmospheres because all lumber, hardware, supports, bracing and columns are designed to make an engineered structure.

COMPLETELY SAFE OPERATION... Stairways, handrails, walkways, and fan cylinders insure safe operation and maintenance in any kind of weather.

MINIMUM DRAFT LOSS . . . Drift eliminators set in slanting position allow greater area for air passage, minimizing draft loss and reducing horsepower requirements.

GREATER COOLING CAPACITY . . . Packed with decks of nail-less filling, Double-Flows have more wetted surface therefore greater cooling capacity.

If you're looking for GREATER SERVICE, LOWER COST and IMPROVED WATER COOLING EFFICIENCY in your plant, be sure to ask a MARLEY "Double-trained" APPLICATION ENGINEER to analyze your situation and recommend the COOLING TOWER you need to meet your requirements. There's no cost or obligation.

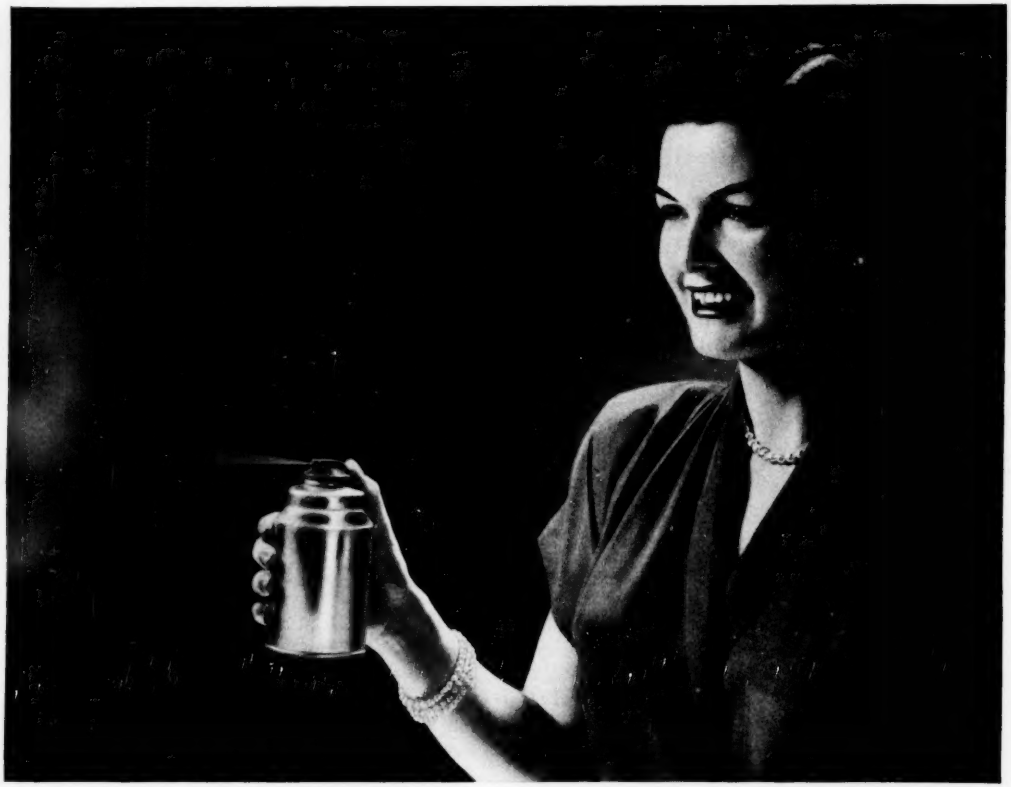
Photo by Elwood Payne

MARLEY COOLING TOWERS

THE MARLEY COMPANY, INC. • KANSAS CITY 15, KANSAS

WATER COOLING TOWERS · DRICOOLERS · SPRAY NOZZLES

CROWN SPRA-TAINER



Most Important Can Invention in Years!

For over 50 years, cans have been manufactured in the conventional way of soldering and fabricating. Then Crown invented the can with no-side-seams and no-top-seam. To this was added a special valve—and Spra-tainer was born, the first can to spray out the contents under gas pressure. Now being used for Whipped Cream, Insecticides, Air-Conditioners, Perfumes, Plastic Sprays. Just press the top—and contents sprays out. How about *your* product —wouldn't it sell better in a Spra-tainer? Ask to have a Crown sales representative call.

One of America's Largest Can Manufacturers

CROWN CAN

PLANTS AT PHILADELPHIA, BALTIMORE, CHICAGO, ST. LOUIS, HOUSTON, ORLANDO • ***Division of the Crown Cork & Seal Company***

Food Industry News

Administration Eyes Coming Election In Stumping for Brannan Plan

President Truman was asked at a recent press conference why his Secretary of Agriculture, Charles Brannan, doesn't stay at his desk in Washington more, instead of romping around the country plugging for his farm plan.

Truman said emphatically that Brannan was out stumping the country at his—Truman's—suggestion.

The Democrats are going to keep stumping from now until next fall's Congressional elections—selling farmers and city workers on the beauty and benefits for both wrapped up in the Brannan farm plan. To really put punch into their sales campaign, the Democrats are hoping they will be able to point to a new "horrible example" of the workings of price supports under present law—a support price operation on pork.

Such a program, which already seems in the cards, would fit beautifully into the part of the Brannan plan the Democrats are going to hammer hardest—the use of direct payments to farmers for perishable foods like meat, dairy products, poultry and eggs.

Biggest Peacetime Pig Crop

Government economists are split on predicting whether or not they will actually have to support prices of porkers this fall and winter by buying the meat and putting it into storage. But meat packer experts say the figures almost guarantee the government will have to step in.

The biggest peacetime pig crop ever is now being shipped from the farms. There will be about 1,000,000,000 lb. more of pork marketed this fall and winter than a year ago.

If the support program is put into operation, it will do more to focus public attention on the cost of farm price supports than any other single factor. Up to now, government support-buying of potatoes has been the Alice-in-Wonderland example used by critics of present price support policies—including Brannan. In the last two years the government has shelled out $230,000,000 of the taxpayer's dollars to keep up the price of potatoes.

But pork-buying for the same purpose would be far more powerful ammunition. Pork and potatoes are akin, in certain respects: Both are perishables. Pork, however, can be stored for a few months, potatoes can not. Price of both is guaranteed to farmers by the government—potatoes at 60 percent, pork at 90 percent.

But in the eye of the consumer—who is also a voter and taxpayer—there is all the difference in the world between the two. Pork is meat. And it is high meat prices that the housewife and her husband associate with high prices for food in general.

Potatoes at 4c. per lb. do not stir up any excitement. Pork chops at 80c. per lb are talked about.

To the farmers, too, pork is more important. First, there are more farmers who raise hogs or corn for hogs than there are potato farmers. Second, the total money farmers make from pigs is many times the amount potato farmers make from spuds.

To Examine Food Packaging At 11th Institute Forum

Food industry representatives will play a prominent part in the eleventh annual forum of the Packaging Institute, scheduled for the Hotel Commodore, New York, October 24 and 25.

Leading off the first general session will be L. V. Burton, former editor of FOOD INDUSTRIES and now executive director of the Institute. Dr. Burton will deliver the theme address: "Packaging for the Buyers' Market; Quality, Cost and Marketing." At the same session, Arthur D. Hyde, vice-president, General Mills, will discuss "What Management Expects of Packaging." Later sessions will hear L. F. Borchardt, General Mills, and Robert de S. Couch, General Foods, on packaging research operations; C. E. Felt, General Mills, David Carpenter, P. Duff & Sons; and C. K. Weisman, Armour & Co., on food packaging developments.

A final seminar that should hold wide interest for food-plant men brings together A. F. Stevenson, Borden Co.; G. M. Woodruff, General Foods; George Garnatz, Kroger Food Foundation; and John A. Warren, American Home Products Co.; along with Maurine Ponder, Joseph E. Seagram & Sons; and Adolph E. Tiesler, Lederle Laboratories. This group will discuss production-line problems.

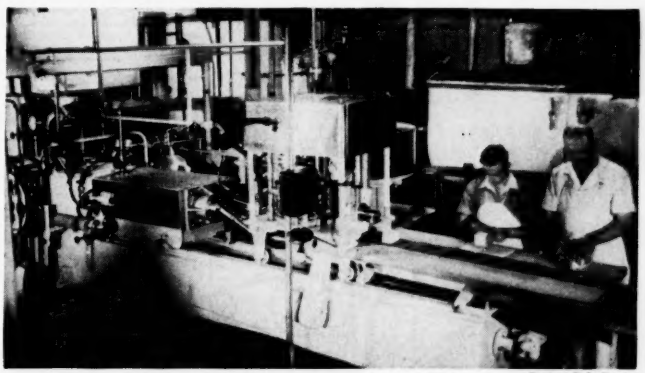
The Institute is also playing host to prepackagers of fruits, vegetables and meats, who will be given the opportunity to organize, either as an independent group or as a division of the Institute.

Halts U. S. Baby Soups, Expands in Canada

Campbell Soup Co. is enlarging the territory in Canada in which its baby soups are being offered and will push these items vigorously throughout the dominion.

Production of baby soups has stopped for the time being in the United States.

(Industry News Continued)



Eastern Pub. Service

Non-Stop Butter Making

Australia has adapted the "New Way" continuous butter making machine, and here it is seen in action at Terang Butter Factory, Victoria. The machine delivers the butter in ¼ lb. or 1 lb. blocks, or in cases of 48 lb.

Yearly Union Elections Get NLRB Approval

Union representation elections may be held annually, even though a union seeking to represent the workers has repeatedly failed to secure a majority in similar elections conducted in the same plant by the National Labor Relations Board.

NLRB refused to dismiss the petition of AFL Cannery Workers for an election at Fruitvale Canning Co., Oakland, Calif., although they had lost elections in each of the three past years.

In ordering the election, the Board dismissed the contention of Food & Tobacco Workers that another election this year would "unduly harass" them in their function as representative of the employees. The Board said employees are entitled to an election each year.

NLRB decided that the twelve-month limitation of Taft-Hartley Act begins from the date of the balloting rather than the date of final determination of results.

The Board also ruled that it is not precluded from issuing direction of election within the year's time, as long as elections are held not oftener than annually.

Pillsbury Broadcasts Annual Meeting

Pillsbury Mills, Inc., Minneapolis, broadcast its Annual Meeting, in Minneapolis, September 13, as a "special events" program. The program briefly explained the structure of an annual meeting, described the legal transactions, and included short reports on the company operations by top executives.

Recordings were made while the meeting was actually in progress in the auditorium of the Pillsbury building and will be distributed to schools for education in business methods.

This is thought to be the first time a corporation's annual meeting has been opened to the public by radio. Philip W. Pillsbury, president, said that business is everybody's business, and that since most people never have a chance to attend a large company's annual meeting, this will bring the facts of the company's operations to everyone.

FTC Names Food Targets In "Big" Witch Hunt

A half-dozen segments of the food industry are singled out in a new anti-big business report on 26 industries the Federal Trade Commission has made to Congress. Its title: "The Concentration of Productive Facilities."

The report spells out how a few companies in each of 26 industries own a large percentage of the total assets of the whole industry. Its purpose is to help along the anti-monopoly legislation being proposed in Congress and to help out Rep. Celler's House committee now conducting a running investigation of big business.

In summary, FTC's report shows the following percentages of their industry's total net capital assets as being owned by the largest companies.

In meat packing, four companies own 69.3 percent; and eight own 77.6 percent.

In canning and preserving, four companies own 39.4 percent, and eight own 51 percent.

In grain mill products, four companies own 36.3 percent, and eight own 48.6 percent.

In bread baking, four own 30.6 percent, and eight own 38.2 percent.

In biscuits, crackers and pretzels, the largest company owns 46.3 percent; the four largest companies own 71.4 percent.

In dairy products, four companies own 59.6 percent and eight own 71.3 percent.

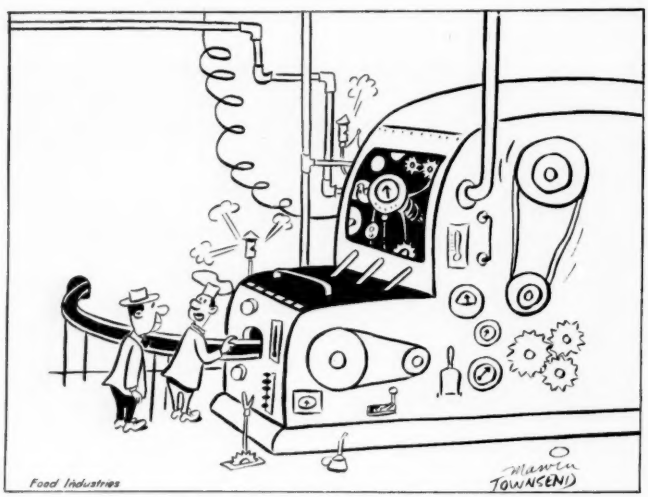
In tin can manufacture, four companies own 96.4 percent; the largest company owns 55.2 percent.

The FTC analysis will be ammunition next year for anti-monopoly Senators like O'Mahoney, Kefauver, and Long in pushing for Senate approval of the anti-merger bill already approved by the House. That's the bill that closes a loophole in the Clayton Act by giving FTC power to block mergers accomplished by one company's buying up the physical assets of another, where the effect is to substantially lessen competition.

FTC's breakdown follows:

Percent of Net Capital Assets Owned by Largest Corporations, 1947

Armour & Co.	28.8
Swift & Co.	25.9
Wilson & Co., Inc.	9.3
Cudahy Packing Co.	5.3
Morrell, John & Co.	3.2
Rath Packing Co.	2.2
Hormel, George A., & Co.	1.5
Mayer, Oscar, & Co., Inc.	1.4
Canning & Preserving	
Heinz, H. J., Co.	10.7
California Packing Corp.	10.7
Campbell Soups	10.6
Libby, McNeill & Libby	7.4
Hawaiian Pineapple Co., Ltd.	4.8
Stokely-Van Camp, Inc.	3.1
Alaska Packers Assn.	2.0
Deerfield Packing Corp.	1.7
Grain Mill Products	
General Mills, Inc.	15.6
Quaker Oats Co.	7.9
Pillsbury Mills, Inc.	6.7
Ralston Purina Co.	6.1
Kellogg Co.	4.4
International Milling Co.	3.6
Flour Mills of America	2.3
Russell-Miller Milling Co.	2.0
Bread & Other Products	
Continental Baking Co.	13.0
General Baking Co.	7.0
Purity Bakeries Corp.	5.4
Ward Baking Co.	5.2
Interstate Bakeries Corp.	3.0
Langendorf United Bakeries, Inc.	
American Bakeries Co.	1.6
Hathaway Bakeries, Inc.	1.5
Dairy Products	
National Dairy Products Corp.	27.5
Borden Company, The	21.4
Carnation Company	6.9
Beatrice Foods Co.	3.8
Pet Milk Co.	3.4
Fairmont Foods Co.	3.3
Golden State Co., Ltd.	2.9
Arden Farms Co.	2.1
Tin Cans & Other Tinware	
American Can Co.	55.2
Continental Can Co., Inc.	36.7
National Can Corp.	3.2
Pacific Can Co.	1.1
Biscuits & Crackers	
National Biscuit Co.	46.3
Sunshine Biscuits, Inc.	10.7
United Biscuit Co. of America	10.7
Carr Consolidated Biscuit Co.	3.7
Burry Biscuit Corp.	.5
Manischewitz, B., Co.	.3



"This machine puts the pimento in olives."

Wide World

Grapefruit For Free

If grapefruit is short this year, the season's first hurricane gets a major share of the discredit. Losses were estimated at from 10- to 12,000,000 boxes of grapefruit; 3- to 5,000,000 boxes of oranges, and 4,000,000 boxes of tangerines.

Food Earnings Decline Despite Exceptions

Recent financial statements reveal a continuing downward trend in food company earnings, although four notable exceptions, two of them in the dairy field, painted a brighter picture.

National Dairy Products Corp. earned $16,537,423 for the first six months of this year, compared with $13,324,874 in the same period in 1948. Total sales, on the other hand, dropped to $456,218,089, from $483,308,770.

Borden's estimated net income for the first six months comes to $10,200,000 as against $9,000,000 in the first half of 1948. Sales dropped to $305,047,723 from $309,819,906.

Increases in both sales and earnings are shown in the annual statement of Hawaiian Pineapple Co., whose net profit jumped to $4,635,989 for the year ended May 31. Earnings the previous year were $2,927,658. Total sales came to $54,270,530 this year compared with $45,267,690 in 1948.

Canada Dry's nine month statement shows higher net sales but lower earnings. For the nine months ending June 30, net sales came to $36,582,549 as against $35,773,851 a year ago. Net income for the two periods were $1,270,297 and $1,422,568 respectively.

The Best Foods revealed net earnings of $4,705,576 on sales of $90,176,629 for the year ending June 30. This compared with earnings of $9,539,395 on sales of $105,269,971 during the previous year.

Stokely-Van Camp reports net sales of $95,037,212 for the year ending May 31, against $95,110,041 for the previous year. Earnings were $2,979,576, a rise over the $2,520,504 earned the previous year.

General Mills Shakes Up Southeastern Division

James J. Selvage, president of the Southeastern Division of General Mills, with headquarters in Atlanta, and vice-president of the parent corporation, General Mills, Inc., has resigned to enter business for himself.

Harris Mills, formerly vice-president of the Southeastern Division of General Mills, has been appointed president to succeed Mr. Selvage.

At 55, Mr. Selvage said he had reached the earliest retirement age allowed by General Mills. He has been with the company for 35 years.

Mr. Selvage conducted a Southeastern survey in 1934 which resulted in the organization in 1935 of the Southern Gold Medal Flour Co. This company became the Southeastern Division of General Mills and Mr. Selvage served as vice-president and general manager and later became president of the Southeastern Division.

Mr. Mills will have full responsibility for operation and management of the Southeastern Division. He has been with the company for 30 years, the past 14 years associated with Mr. Selvage in the Atlanta office.

Candy Conference

The 4th annual production conference, sponsored by the Pennsylvania Manufacturing Confectioners' Association, will be held on April 27 and 28, 1950, at Lehigh University, Bethlehem, Pa. Hans F. Dresel, 15 Lombard Street, Philadelphia 47, has been appointed chairman and has requested suggestions be sent directly to him.

Acknowledgment

The article, "Enriched Food Products Are Credited for Better Health in Newfoundland," which appeared in the July issue of FOOD INDUSTRIES, under the by-line of R. M. Wilder, was a combined report, prepared by all members of the Newfoundland Nutrition Survey. The other members are W. R. Kaykroyd, N. Jolliffe, O. H. Lawry, P. E. Moore, W. H. Sebrell, R. E. Shank, F. F. Tisdall, and P. C. Zamecnik.

(Industry News Continued)

Everyone has problems

If yours happens to be an emulsifier for process cheese, or dairy products . . . *Investigate*

VICTOR DISODIUM PHOSPHATE, DUOHYDRATE

Disodium phosphate, duohydrate is a product recently added to the Victor phosphate family. At present, it finds its greatest application as an emulsifier for process cheese, and evaporated milk. In each of these cases, disodium phosphate, duohydrate produces a smooth and creamy product. The important advantages of this Victor phosphate are its rapid solubility, free-flowing character, extremely high purity, and uniformity. Investigate Victor disodium phosphate, duohydrate today! Your request for an experimental sample or quotation will be given prompt attention.

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Investigate Now! MAIL THIS COUPON TODAY!

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Please check
☐ Sample of disodium phosphate, duohydrate.
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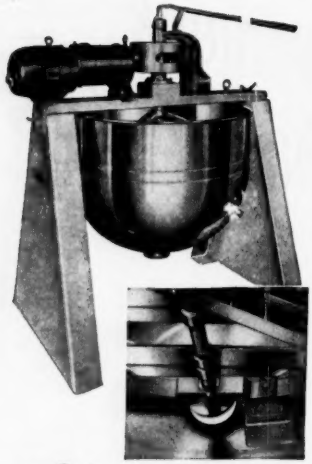
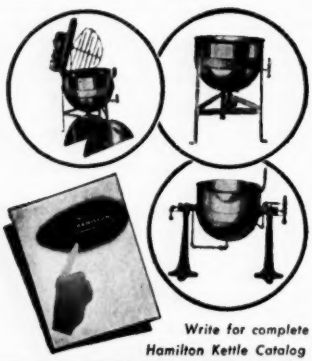


POP the valve open...
POP the valve shut...
and this agitator keeps mixing
all the while... **DOUBLE MOTION!**
(Valve diameter up to 6")

It's the newest in kettles...

The **HAMILTON**
***Roto-Speed* "MIX-COOKER"!**

We believe it to be the finest steam-jacketed kettle for products which tend to settle or choke up. Cooks fast. Mixes thoroughly. Empties fast and clean. Operates at a touch. We'd like to tell you all about this "MIX-COOKER" for "problem products." Users are happy!



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HAMILTON
COPPER & BRASS WORKS, INC.
HAMILTON, OHIO
one of the
ALVIN HOCK INDUSTRIES

Wide World

Pork Storage

Studies on ham and bacon storage at the Georgia Experiment Station account for the odd looking slab of bacon held here by H. R. Cecil, associate food technologist. Answer: Should be stored at 50 deg., and a 65 percent relative humidity.

PROCESSING

Dangerous to Generalize On Chemical Damage

Chemical spray residues may cause serious damage to food crops. But some recent glib generalizations are proved to be wholly unjustified by investigations of the Department of Agriculture. A few pertinent facts are gradually becoming clearly evident, both regarding the effect of insecticide residues on the supply of raw material for food plants and regarding the damage to both flavor and wholesomeness of these materials after they have been processed.

When organic chemicals were first offered as substitutes for insecticides containing lead, arsenic, and fluorine, it was incorrectly assumed that these organics would not persist on the food, or elsewhere, as hazards. Studies covering five years or more have proved conclusively, according to statements of the Bureau of Plant Industry specialists, that such materials as DDT do persist in the soil for a considerable number of years. Some contaminated soil, although utilized in the open for more than five years, retains the original toxicity for vegetables that it had when first treated with this chemical. This is true of at least four important soil varieties and also of several other important insecticides widely used in large quantity.

Two effects have been definitely identified: In some cases the insecticide prevents a plant from extending its root structure and absorbing needed nutrients from the soil. In the case of DDT, for example, this occurs without having the plant absorb the chemical. In the case of benzene hexachloride, on the other hand, the chemical is absorbed by the plant and is found in the fruit or vegetable portions as a highly objectionable component of musty odor.

Under 25 lb. Per Acre

The seriousness of the effects is well illustrated by results obtained with DDT, which is retained in the soil in highly objectionable quantities if used at the rate of 25 lb. or more per acre. With some crops, a smaller use is common. But in certain localities as much as 90 lb. per acre per year has been utilized.

The results are specific. The familiar canning tomato of California is highly resistant to such soil poisonings, but the two most-used canning varieties in the east are highly sensitive. Similarly, bunch beans of different varieties may be extremely sensitive, or slightly affected, or almost wholly tolerant without any evident reason for the differences. Generalization is wholly unjustified, the plant pathologists tell us.

Agronomists assisting food companies are urged by the Department of

Agriculture to give increasing attention to these problems, both to insure better crop yields and to prevent incidence of unusable products, such as vegetables with a musty flavor, which may be caused by benzene hexachloride.

Food Union Covering Communist Tag

The Food, Tobacco and Agricultural Workers have joined the parade of left-wing unions whose officers are resigning from the Communist Party so that the unions can get in compliance with the Taft-Hartley Labor Law. Resignation from the party is necessary because one of the steps in complying with the law is the filing of non-Communist affidavits.

The National Labor Relations Board blocked an attempt by the food union to get into compliance without an affidavit from Donald Henderson, who has led the union since its beginning in 1937. To avoid signing an affidavit, Henderson resigned as union president and had the executive board create a new position for him, that of national administrative director. John Tisa, organization director, took on the added duties of acting president.

All the union's officers, except Henderson, then signed non-Communist affidavits. NLRB took the position that Henderson was still an "officer," and asked him to show cause why he should not sign an affidavit also.

When Henderson failed to do so,

(Industry News Continued)

USO Reorganizes

With a large-scale peacetime military establishment requiring its services, the USO has been reactivated with Harvey S. Firestone, Jr., as the new president. Funds are to be raised this fall through Red Feather and independent campaigns.

Only $2.98 helps put new "sell" in television advertising

Sponsor of television show had to refilm his commercials to meet a new selling problem. New films picked up at studio 4 P.M., delivered to TV station 800 miles away 8:47 P.M. same evening. Air Express cost for 11-lb. carton, $2.98. (In *undramatic* fashion Air Express keeps radio, television or any business rolling.)

Remember, $2.98 bought a complete service in Air Express. Rates include door-to-door service and receipt for shipment—plus the speed of the *world's fastest* shipping service.

Every Scheduled Airline carries Air Express. Frequent service—air speeds up to 5 miles a minute! Direct by air to 1300 cities; fastest air-rail to 22,000 off-airline offices. Use it regularly!

Only Air Express gives you all these advantages

Nationwide pick-up and delivery *at no extra cost* in principal towns, cities.

One-carrier responsibility *all the way;* valuation coverage up to $50 without extra charge. And shipments always *keep moving.*

Most experience. More than 25 million shipments handled by Air Express.

Direct by air to 1300 cities, air-rail to 22,000 off-airline offices.

These advantages make Air Express your best air shipping buy. Specify and use it regularly. For fastest shipping action phone Air Express Division, Railway Express Agency. (Many low commodity rates in effect. Investigate.)

SPECIFY AIR EXPRESS
GETS THERE FIRST

Rates include special pick-up and delivery door to door in principal towns and cities

AIR EXPRESS, A SERVICE OF RAILWAY EXPRESS AGENCY AND THE
SCHEDULED AIRLINES OF THE U.S.

TRUCKERS — AND THEIR BOSSES AGREE ON

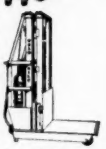
"Weld-Bilt" PRODUCTS

Weld-Bilt Wide Model Hydraulic Lift Truck

Let your truckers try the easy-rolling WELD-BILT Lift Truck on your job. They'll quickly show you it moves with less effort, is simpler to operate, easier to maneuver into accurate position. It saves time that can be added to profitable production.

Pallet Trucks

Just as important to you . . . WELD-BILT Hydraulic Lift Trucks are engineered and built for longer service — and prove it daily in thousands of plants. One of many reasons for this is HORIZONTAL MOUNTING of the Hydraulic Unit, locating it in a protected position away from any danger of knocks and bumps. And, because this unit is interchangeable, it can be replaced for extra years of service.



Portable Electric Elevators

Skid Platforms

Put the easier-handling, longer-wearing WELD-BILT Hydraulic Truck to work smoothing out your materials handling problems. There's a size to fit your needs exactly. Write for bulletin and details.

Two-Wheel Trucks

WELD-BILT Products Include: Portable Electric Elevators, Hydraulic Lift Trucks, Pallet Lift Trucks, Platform Trucks, Two-Wheel Trucks, Skid Platforms, Tiering Machines and other special equipment.

Platform Trucks

WEST BEND EQUIPMENT CORPORATION

Materials Handling Engineers

301 Water Street, West Bend, Wisconsin

British Combine

Garden Space

This mid-street garden is far from a rare sight over in Berlin, where seeds received from U. S. through CARE are planted and cultivated by impoverished Germans. Shipments of these seeds by private individuals has been a boon to many.

NLRB left the union off the ballot in an election ordered among employees of the Alaska Salmon Industry, Inc. This gave a clear field in the poll to the United Alaska Fishermen & Cannery Workers, an AFL union.

Within a few days, however, Henderson signed an affidavit so the union would not be jeopardized in elections pending at R. J. Reynolds Tobacco Co., Greensboro, N. C., and Piedmont Leaf Tobacco Co., Winston-Salem, N. C. In these elections a rival CIO union, the Tobacco Workers Division of the United Transport Service Employees, is also a contender.

In a statement accompanying his capitulation, Henderson said he had resigned from the Communist Party but would continue to carry out the union's "progressive fighting program." In Communist parlance, a "progressive" is one who follows the party line.

Two other CIO union leaders have signed affidavits after resigning from the Party, while at the same time declaring they still believed in Communist principles and would continue to fight for them. They are Maurice Travis, secretary-treasurer of the Mine, Mill & Smelter Workers, and Max Perlow, who holds the same position with the United Furniture Workers.

Since the affidavits state that the signer does not believe in Communism, besides not being a member of the Communist Party, there is some doubt as to the propriety of the affidavits signed by union leaders who still espouse Communism although dropping membership in the Party organization.

Grants $1,800 to Study Dirty Egg Causes

Institute of American Poultry Industries has made an $1,800 grant for one year to the University of Missouri College of Agriculture to finance a study of the dirty-egg problem. An objective is to reduce the number of eggs requiring washing or cleaning before marketing or use. First approach is to be a study of types of nesting materials that show most effective performance in keeping eggs from becoming dirty.

The work will be done by Milton Dendy, a graduate student majoring in poultry husbandry, under the direction of E. M. Funk, professor of Poultry Husbandry. It is part of the Institute program in egg quality improvement.

Macaroni Men Discuss Plant Operations

Materials handling, quality control, drying, air conditioning and equipment design were discussed at a two-day forum on macaroni plant operations, at Northwestern University, under the management of Glenn G. Hoskins Co., Chicago, late in July.

Forty-nine macaroni manufacturers attending the conference participated in the open forums held for ten minutes each hour after the presentation of prepared papers, and exchanged experiences in seeking solutions to production problems. At the close of the conference each registrant possessed a loose-

leaf binder containing copies of the prepared papers, plant layout drawings, equipment catalogs and photos, engineering data and similar sources of information of reference value.

Virtues of the new pneumatic system for handling flour were covered by W. G. Hoskins in his discussion on manufacturing costs, Federal Food & Drug Administration regulations and the New York City Health Department requirements covering equipment design and construction. In all instances the objective is equipment which reduces plant operating costs, permits easy cleaning and aids in maintenance of sanitary plant conditions.

The roles of screw conveyors, bucket elevators, endless belt conveyors and lift truck handling with the aid of pallets were also dealt with. In his comparison of motor power advantages over those of manpower, Glenn G. Hoskins stated that any labor-saving installation which pays for itself by savings in five years is a profitable investment.

Manufacture and the problems of maintenance of macaroni dies were explained by C. Daniel Maldari, Donato Maldari & Sons, New York, N. Y. His presentation was illustrated with photographic slides and included selection of materials, design specifications, production technics, and maintenance of dies. Three macaroni defects attributed to dies are "dough rings", "splits" and "roughs". It is true that not all causes of "dough rings" are known, but

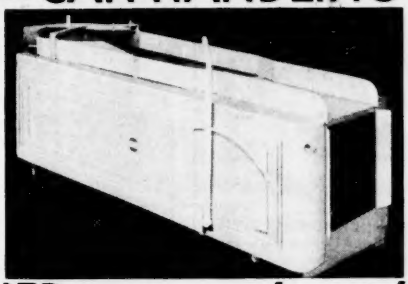
(Industry News Continued)

Combine

Marshall Aid Sugar

U. S. and British food administrators help Minister of Food John Strachey watch the unloading of the first cargo of sugar under Marshall Plan aid. The sugar came from Santo Domingo and is expected to help Britain maintain its present sugar rationing scale.

CUT *your* CAN-HANDLING COST



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The can feeder is automatic. It will handle cans of any size and deliver them to the can conveyor line at any speed. For example, 6 ounce cans may be delivered at the rate of 1000 per minute if necessary.

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A simple, "O" ring seal, fully approved, eliminates mass of small seal parts. The smooth, positive action of the Viking "gear within a gear" principle assures steady delivery without splashing, foaming or pounding.

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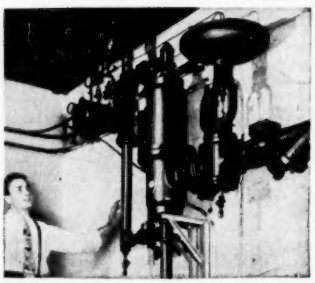

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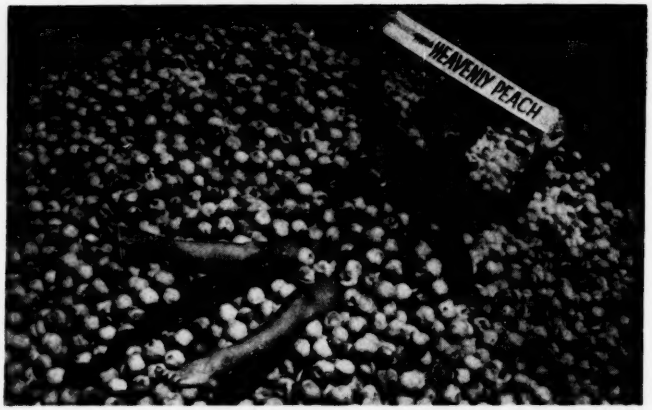

Wide World

Canners' Choice

Cannery workers in Fullerton, Calif., chose this miss to help them celebrate the beginning of the peach canning season. With carryovers cleaned up all along the line, the new peach pack, slightly under last year, appears to have clear sailing.

worn die outlets and running of hot presses to increase rate of production were cited to be two which are known. Presence of grit in dough and die wear including corrosion are respectively regarded causes of "splits" and "roughness" in macaroni.

Cost and performance factors in air handling were treated in considerable detail by W. G. Hoskins. In view of the large volumes of moisture vapor involved in the making and drying of macaroni products and the varied conditions under which plants operate, recommendation was made that requirements be submitted to air handling and air conditioning engineers. Proper size of installations to meet requirements is more important than first cost. Also proper air handling in a macaroni plant should be regarded as an operation of first importance.

Compares Dryers

Making of good drying weather to order and a comparison of types of dryers with respect to advantages and defects were discussed by Charles M. Hoskins, with the concluding statement that there are still many unexplored areas in the field of macaroni drying.

As the basis of a good program for quality control, Charles M. Hoskins suggested that a chief inspector be appointed in each plant and that he report directly to the plant manager. This inspector is to be responsible for quality control throughout the plant. The recommended overall program includes an educational program to acquaint the employees with their responsibility, a quality control laboratory with established procedures in sampling and testing and the establishment of specification standards for the raw materials and finished products.

Propose Macaroni Standards

The macaroni industry is well through the current business recession, according to C. L. Norris, Creamette Co., Minneapolis, president, National Macaroni Manufacturers Association, at a recent meeting in Chicago.

He said that this year the industry produced 140 percent of the average for the five years before the war, and stressed the convention theme: Better materials, better methods, better merchandising for better business.

B. R. Jacobs, Brooklyn, director of research, reported that work is being done in cooperation with the Food & Drug Administration on proper labeling of macaroni products and on uses for surplus flours. He said that the millers and macaroni association officers proposed standards of quality for macaroni to require it to be made from semolina or farina with a permissible flour content of 10 percent instead of the present-day 3 percent. If it is made from flour, he said it should be labeled "substandard".

Acceptability Course

Illinois Institute of Technology will offer a graduate course in food acceptability technics beginning September 21, and continuing through January 25, 1950. The course will consist of 16 two-hour lectures.

F&DA Food Standards

As predicted last month, *canned pineapple* and *canned pineapple juice* will be discussed at a hearing beginning on October 17, with a view to establishing standards of identity, quality, and fill of container. Mr. E. E. Turkel has been designated as presiding officer. The proposed standards were printed on page 4887 of the August 6 *Federal Register*.

Cheese standards of identity have been somewhat further delayed by extension of the date by which comments on the tentative order may be received. The second extension was from August 20 to October 4. Final order on this docket presumably will be issued as soon after that date as adequate consideration can be given to the comments received. Effective date of the standards, when issued, will probably be early 1950.

Bread standards hearing took an unexpected recess from August 12 to September 7. At the time when the hearing resumed, it was hoped that about three weeks more testimony would complete this hearing. Final adjournment, if by October 1, would indicate that briefs might be filed early in 1950. A tentative order probably will not appear before Spring. Final order and effective date of the standards, when issued, will probably be about 12 to 18 months from now.

Canned mushroom standards of identity were considered at a short hearing on August 18. Request for use of relatively large amounts of ascorbic acid to retard darkening of mushrooms when packed in glass containers was lodged by one packer and one container manufacturer. Other packers, who did not object, pointed out that some investigation should be made of the effect on mushrooms when packed in tin containers, using comparable amounts of ascorbic acid. The effect of the ascorbic acid on color of the mushrooms, and therefore on the apparent mushroom quality or grade, was also raised.

Sugar Studies Include New Industrial Uses

New appropriations totalling $100,000 for research on sugar as a food and as an industrial raw material have been announced by Dr. Robert C. Hockett, Scientific Director of Sugar Research Foundation.

Six projects are concerned with new uses for sugar and molasses. Five studies on the properties of sugar in baking, fruit freezing and food technologies will be continued. With the new preliminary list of grants, the

(Industry News Continued)

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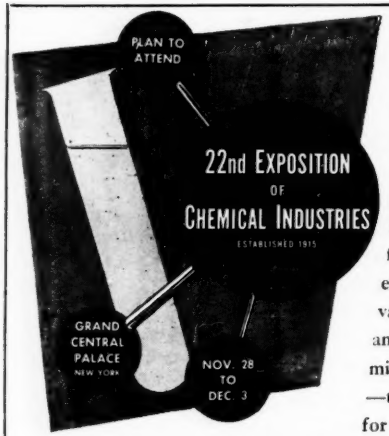

Here is an unequaled opportunity for chemists, engineers, plant executives, and others in the food industry—to see and learn from over 350 informative exhibits about the latest advances in materials, methods, and equipment for their chemical processing requirements —to get a wealth of new ideas for reducing costs, increasing production efficiency, and improving products—to discuss problems and plans with technical representatives of exhibitors here to help adapt the newest techniques and equipment to your food processing operations.

How else can you get so much valuable information in such a short period of time? Like thousands of others, you can make yours a more important job by being fully informed. Plan now to attend.

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Award to General Foods

Cited for its outstanding accomplishment in rapid-learning technics and mass training, General Foods Corp. was selected for the Third Annual Distinguished Service Award of the Special Devices Association. Rear Admiral Luis de Florez, USNR, chairman of the association's award committee, makes the presentation to Austin S. Igleheart, GF president. General Motors and AT&T were previous winners.

sums for research made available since 1943 now total more than $1,500,000, Dr. Hockett said. At present the program is supported by almost the entire domestic sugar industry, including cane sugar refiners, sugar beet processors, and raw sugar producers, as well as members in Canada and the Dominican Republic.

The following officers were elected to serve for the coming year: President, Ernest W. Greene, vice-president of Hawaiian Sugar Planters' Association; Vice-Presidents, Robert H. Shields, president of U. S. Beet Sugar Association, and Victor L. Johnson, vice-president of The American Sugar Refining Co.; Scientific Director, Dr. Robert C. Hockett; Treasurer, F. A. Davidson, president of Refined Syrups & Sugars, Inc.; and Secretary, Neil Kelly.

Navy Cookbook Utilizes Processed Foods

About half of the 600 recipes from the 1945 edition of the *Navy Cook Book* have been tested in the dietary kitchens of the 14 members of Navy Industrial Association. This project was started late in the spring of 1948, and was to be completed by 1951.

Clark V. Kizzia, of General Foods Corp., is chairman of the NIA project. Purpose of the program is to assist the Navy in revising its recipe service and to keep the Subsistence Division

of the Navy abreast of current developments in the food field. Sought are more nutritious and more palatable meals for Naval personnel, both ashore and afloat.

Included in the items tested are recipes calling for the alternate use of fresh, frozen, dehydrated or canned food items. This is done to provide a recipe adaptable to whatever supply storage conditions may confront various Navy galleys.

Ban Compound 1080

The Kentucky State Health Department has notified all food-handling firms in the state that the use of Compound 1080, a deadly rat poison, on their premises will result in prosecution. The poison is as deadly to human beings as it is to rats, it is said.

Establishments allowing use of the poison will be subject to fines up to $100 and their personnel subject to jail sentences up to 30 days.

DISTRIBUTION

Beer and Ale Production Ahead of Last Year

Taxpaid withdrawals of beer and ale from the nation's breweries totaled 49,510,136 bbl. during the first seven months of this year—an increase of 685,856 bbl. over the corresponding period of 1948—according to E. V. Lahey, president of the United States Brewers Foundation.

While sales increased, beer and ale production also climbed. Total malt beverage output in the U. S. for seven months ending July 31, aggregated 53,717,104 bbl.—an increase of 2,088,305 bbl., or 4 percent over the same period last year.

During July alone, 9,381,685 bbl. of beer and ale were produced. This is 1.4 percent more than the output in June, and 464,531 bbl. or 5.2 percent more than July, 1948.

Sales of beer and ale by the breweries of the nation in July showed the largest increase in the West North Central Region, which includes Minnesota, Iowa, Missouri and Nebraska. The increased sales in this territory amounted to 13.9 percent.

Following settlement of the strike which last spring paralyzed New York City's brewing companies, the State of New York again took the lead in tax paid withdrawals of beer and ale among the ten leading states. Wisconsin is in second place.

Federal taxes for the first seven months are higher by $5,206,043, or

(Industry News Continued)

J&C*

Zenith

New ZM Press

The ZM Continuous Pulp Press is the answer to the demand for a press of smaller capacity, but retaining the high efficiency and all of the outstanding features of the parent press.

ZL Press

Zenith* Model ZL Pulp Presses are being used for dewatering, beet pulp, pineapple, tomato pomace, corn germ and fibre, vegetables, brewers grain, cherries, citrus fruits, fish, paper pulp, and many other materials, assuring a direct cake of uniform consistency.

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100% continuous . . . from storage bin to pressed cake, the ZL Press dewaters *up to 26 tons of wet pulp per hour.*

Model ZP . . . our smallest press with less capacity than the ZM or ZL but having a very high efficiency.

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NEW MAGNETIC GRATE • BY Bauer

THE BARS are highly magnetized Alnico. Grate is laid in floor opening or throat of hopper. Wire grid over grate (not shown in picture) deflects material against magnetized bars. All ferrous objects, regardless of shape and size, are caught by magnets. Strings, paper, rags, sticks, stones, etc., also stopped. Assembly is easily removed for cleaning.

Bauer Magnetic Grates are available in sizes from 2 x 4 in. up to 6 or 8 ft. square. Just tell us the dimensions you want, and we'll give you a quotation and a prompt delivery date.

This unique permanently magnetized separator is applicable to all flowable bulk materials of sufficient fineness to pass through the interstices—grain, seeds, coffee, tea, spices, nuts, chemicals, etc.

You are invited to ask for literature describing Bauer Magnetic Grates and other Bauer Magnetic Separators. Catalog of the complete Bauer line will also be sent upon request.

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Nicholson Steam Traps

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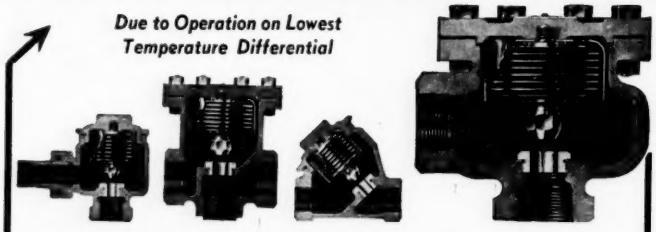
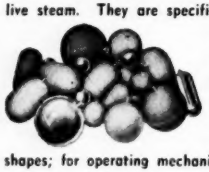


Repeated comparative tests by large users of traps show that Nicholson traps operate on lowest temperature differential: 5° to 15°, depending on trap size and steam pressure. Production of cooking kettles, for example, has been increased as much as 30% because fast action of Nicholson traps keeps equipment full of live steam. They are specified for all apparatus where back-up of condensate causes corrosion or damage to thin gauges. 5 types for every application; size ¼" to 2"; press. to 225 lbs.



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Eastern Pub. Service

Big Pinch

The photographer tells us this is 50 lb. of pure salt, mined at the Las Salinas salt mines in the Dominican Republic. Nothing particularly remarkable about it, but we bought the picture, and so, by golly, we're going to use it.

1.3 percent, than for the similar period of last year. Up to the end of July, the nation's breweries paid into the U. S. Treasury $399,325,675.

Bakers' Fruit Choices Surveyed by USDA

Bakers' preferences as to the various types and kinds of fruits used in baking pies, tarts and other baked goods is currently being sought in a survey by the Bureau of Agricultural Economics, U. S. Department of Agriculture.

Wholesale and retail bakers in Chicago comprise the group being checked regarding the kind of fruits now being used in baking, including apples, peaches, blueberries, apricots, and cherries. The information desired includes the experience bakers have had in the use of different packs of fruit, such as canned, frozen, dried, or fresh fruit. This survey is part of a larger study financed under the Research & Marketing Act and dealing with the economics of new and improved uses of agricultural commodities.

The Bureau of Agricultural & Industrial Chemistry, at its western laboratory, in carrying out the RMA objectives, is conducting research in new fruit products suitable for baking use, particularly in pies. Information is needed as to the qualities and proper-

ties in fruits which bakers think are important so that these qualities and properties may be incorporated in the new products.

New Concentrate Output Optioned to Vacuum

A new company, Ridge Citrus Concentrates, Inc., Davenport, Fla., plans construction of a plant to produce 2,000,000 gal. of citrus concentrates a season, according to Harry Dicristina, temporary president of the new concern.

Mr. Dicristina, who also heads the Holly Hill Fruit Products Co., said that the new firm would purchase some buildings and land from the Holly Hill company and add some new ones.

The output of the new plant will be sold to Vacuum Foods Corp., at Plymouth, for three years. Vacuum Foods has an option for the output for an additional two years.

It is expected that the new plant will be in operation next season. Much of the fruit will be purchased from Holly Hill, supplemented by outside purchases.

This arrangement, adding to the production of Vacuum's own plants at Plymouth and Lessburg, provides a total estimated annual output of 10,000,000 gal. for the producers of Minute Maid.

Slow Decline Predicted For Rice Exports

While no immediate drop in U. S. rice exports to the customary Latin American markets is expected, a gradual decline from the current postwar peak of U. S. rice shipments to Latin America is likely to occur after 1950.

This is the opinion of J. Norman Efferson, marketing specialist who has just returned from a four-month, firsthand study of the rice situation in 11 Latin American areas.

Cuba continues to hold its historical position as the most important outlet for United States rice, Dr. Efferson says, preferring it to rice available from any other country. Cuba may be expected to continue to buy large quantities from this country as long as the price is competitive. Other Latin American areas, including Venezuela, the British West Indies, and Bolivia, still offer possible markets for United States rice surpluses.

American rice of the type represented by the Rexora, Texas Patna, and Blue Bonnet varieties, is considered by Cubans to be the most desirable rice in

(Industry News Continued)

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Your request for a copy of our new catalog insert, describing the Hapman Cable-Veyor in detail, will bring it by return mail.

Wide World

Tomato Melons

His pop claims these tomatoes were grown in the family garden in Auburn, N. Y. The big one being held by the boy weighs 2 lb. 10 oz., and the other 1 lb. 4 oz. Wonder how they do with watermelons?

the world. United States rice producers, Dr. Efferson states, can help maintain their market in Cuba by delivering to that country relatively large quantities of this type and withholding the medium- and short-grain types not liked by Cuban consumers.

The total export supply situation in Latin America in 1949 is less than last year, but over a long-time period the U. S. rice industry must expect gradually increasing competition from Latin American producing areas, as result of increased exports from Colombia and Ecuador, and production of a greater proportion of domestic requirements in Cuba. Brazil will continue to be an important exporter in Latin America.

World News

Puerto Rico Increases Sugar Production

SAN JUAN, P. R.—Puerto Rican sugar production this year amounted to 1,277,491 short tons, an increase of 169,231 over last year's crop. This output established a new record, despite a short strike in January. The yield per acre, however, was lower than last year, according to the Association of Sugar Producers.

The sugar surplus this year is estimated at 206,856 tons, out of which, at the discretion of the United States

Secretary of Agriculture, the necessary sugar for normal inventory will be allocated, as sugar reserve stocks.

It is estimated in industry circles that if 90,000 tons are allocated to the Puerto Rican industry as normal inventory, the balance of 16,856 tons would represent the available sugar surplus, out of which Puerto Rico can ship to Europe under ECA program after the Secretary of Agriculture declares that there is an actual surplus on the Island.

Efforts are underway to make a shipment to Europe to eliminate the surplus. At present, Puerto Rico is authorized to ship 1,070,635 tons to the U. S. market.

Heinz Australia Company Finances Expansion

MELBOURNE—The H. J. Heinz Co., operating in Australia under the control of the English subsidiary, has made arrangements with the Australian Mutual Provident Society for a maximum advance of £1,000,000 (about $2,240,000) for future expansion of its food processing business on the continent.

The insurance company will advance the money in units of £50,000 till September 1958. The funds will be secured by the issue of 25-yr. debentures.

Authorized capital of H. J. Heinz Co. Pty. Ltd. is £500,000, of which £456,000 is issued. Australian sales last year rose 27 percent, to set a new record.

Mexican Grain Buying Under New Agency

MEXICO CITY—Mexico has made a purchase of 1,028,000 bu. of U. S. winter hard wheat from the Continental Grain Co. The purchase was made by the newly organized Mexican Importing & Exporting Co., which replaced the former government-sponsored Nacional Distribuidora y Reguladora agency.

The latter agency lost 300,000,000 pesos (about $7,500,000) during its seven years of operation. The losses were shown to have been caused by subsidies given to local corn and wheat sales and failure of government sponsored retail outlets to pay accounts with the parent concern.

Mexico, due to increased use of hybrid corn, is now self-sufficient in that product, and it is contemplating exporting corn to Venezuela. However, there is little prospect of becoming adequately stocked in wheat and imports will have to continue.

(Industry News Continued)

REDUCE *your hidden* "TAXES"

Slime, off-odors, decreased production, and water contamination are all hidden "taxes" that decrease your profits. But these "taxes" are UNNECESSARY! — IF — you use In-Plant Chlorination. Here's how this winning formula halts these unfair penalties.

SLIME "TAX" — In-Plant Chlorination removes all slime because it prevents bacterial growths at all points.

ODOR "TAX"—In-Plant Chlorination reduces off-odors because it kills the bacteria that produce them.

DECREASED PRODUCTION "TAX"—In-Plant Chlorination increases production by greatly reducing clean-up time.

WATER CONTAMINATION "TAX"—In-Plant Chlorination sterilizes the wash water, fluming water, and cooling water, thus preventing product contamination from those sources.

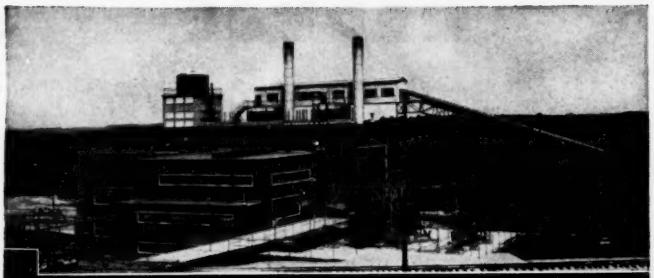
In-Plant Chlorination applied by W&T equipment increases profits by reducing cleaning costs, increasing production, preventing product contamination from unsterilized water, and by the increased efficiency of working in a "spic and span" plant.

Whether it be canning or freezing, removal of these "taxes" will increase your profits.

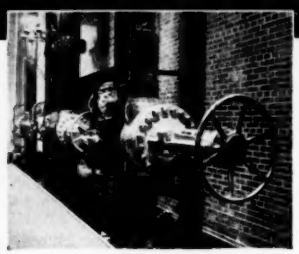
REPEAL THESE HIDDEN "TAXES". Vote the straight ticket, the Wallace & Tiernan ticket of In-Plant Chlorination applied by W&T equipment.

I-25

WALLACE & TIERNAN
COMPANY, INC.
CHLORINE AND CHEMICAL CONTROL EQUIPMENT
NEWARK 1, NEW JERSEY • REPRESENTED IN PRINCIPAL CITIES



More power to Springs Bleachery through LUNKENHEIMER VALVES



ARCHITECTS AND ENGINEERS:
Robert & Co., Inc.
Atlanta, Ga.

CONTRACTORS:
Grinnell Co., Inc., Charlotte, N. C.

Springs Cotton Mills' Bleachery Division at Grace, S. C., is an outstanding development of one of the nation's largest textile manufacturers.

The power plant is based upon two 150,000 lb. per hour boilers. Large numbers of Lunkenheimer Valves including main steam, boiler feed, check and non-return valves, as well as small and large valves ranging from 125 to 1500 lb. standard for miscellaneous services, are used to control the power and process steam, powerhouse water supply, processing and fire protection.

This modern installation is another interesting example of the high regard in which Lunkenheimer Valves are held throughout all industry. If you are planning new construction or modernization of present facilities, it will pay you to specify Lunkenheimer Valves. Their reputation for lower-cost, trouble-free service is industry-wide.

CALL YOUR DISTRIBUTOR

He has the experience and the stock to serve your needs.

ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI 14, OHIO, U. S. A.
NEW YORK 13 CHICAGO 6 BOSTON 10 PHILADELPHIA 34
EXPORT DEPT. 318-322 HUDSON ST., NEW YORK 13, N. Y.

Wide World

French Tuna Hooked American

A nice day's catch was reported by this crew of Cap Breton fishermen as they unloaded tuna, hooked American style off the French coast.

India Processing Costs Far Above U. S.

BOMBAY, INDIA — Important contrasts in costs of food processing between India and the U. S. are given in a study pubiished by the Indian Food Preservers' Association. It is shown that the production cost in India is roughly five times that of the United States.

The Association's study is based on comparative cost of a pound of canned fruit. Following are the figures (in. U. S. cents):

Item	*U. S.*	*India*
Material	2.65	12.25
Labor	.76	2.04
Packing	2.04	7.14
Overhead	.22	2.04
Publicity	.39	(not computed)
Sales	.20	4.42
	6.26c.	28.89c.

Bans U. S. Tinned Milk

MELBOURNE—Singapore has banned the importation of sweetened condensed milk from hard currency areas. Imports from the U. S. and other hard currency areas increased by 437,430 cases to 695,113 cases in 1948. Australia was the leading supplier, with 743,664 cases.

Cargo afloat under licenses already issued will be admitted, but no further licenses will be issued.

(Industry News Continued)

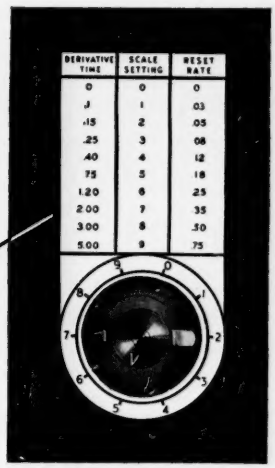
LIFT YOUR PROCESSING TO A NEW HIGH IN ACCURACY

WITH BRISTOL'S NEW CONTROLLERS

Here is a new automatic control instrument that will

★ ***repeat*** **a previously-established action exactly as it happened the first time *every time* you want it . . . or—**

★ ***duplicate exactly*** **the desired action in any like Bristol Series 500 Controller**



BRISTOL'S Series 500 Air-Operated Controllers for temperature, pressure, flow, liquid level

RESET, DERIVATIVE AND PROPORTIONAL TIME VALUES REPRODUCIBLE.

Adjustments are accurately calibrated and exactly reproducible. Similar settings in any Series 500 Controller will produce *exactly the same* values. This means you can replace controllers on a process with full assurance that such replacements will exactly duplicate the performance of the original. No more cut-and-try to arrive at the original setting . . . *saves hours by reducing shutdown time.*

These Features are NEW and EXCLUSIVE

SIMPLEST CONTROL SYSTEM TO SERVICE. Only one service adjustment is needed. The control units and parts making up the control system are so accurately designed and tolerances are so closely controlled that the system can be completely disassembled and reassembled, even with replacement parts, with only one simple adjustment needed to put the system in exact calibration. Almost anybody can service a Bristol Series 500 Controller.

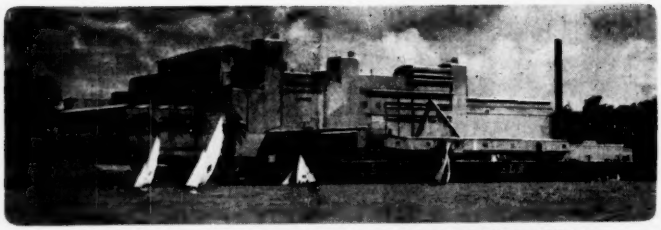
FIVE TYPES OF CONTROL: on-and-off, proportional, proportional plus derivative, reset, reset plus derivative.

Investigate your new opportunity for accuracy and uniformity in automatic control. Write for new bulletin on Series 500 Air-Operated Controllers. THE BRISTOL COMPANY, 115 Bristol Road, Waterbury 91, Conn. (The Bristol Co. of Canada, Ltd., Toronto, Ont., Bristol's Instruments Co., Ltd., Lynch Lane, Weymouth, Dorset, England.)

60 YEARS...1889-1949

BRISTOL

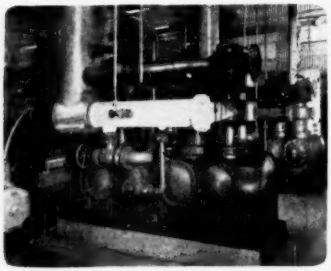
AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS



BIG AUSTRALIAN PACKING PLANT INSTALLS

Frick Refrigeration

The Queensland Meat Industry Board recently installed three Frick ammonia booster compressors for producing low temperatures at the Brisbane Abattoir. The Board says these big machines, each with four cylinders of 15" bore and 10" stroke, "have worked very efficiently," and have increased the output of the freezers at Brisbane by 26%.



Two of Three Frick Compressors at Brisbane

Annual capacity of the plant now approximates 250,000 cattle, 150,000 calves, 50,000 hogs, and 700,000 sheep and lambs.

Whether you're in Augusta or Australia, if you need air conditioning, refrigerating or ice-making equipment in commercial or industrial sizes, there's a Frick system to meet your requirements. Ask for recommendations and estimates.

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA. U.S.A.

Also Builders of Power Farming and Sawmill Machinery

ALKOR FLOORS are CORROSION-PROOF floors

The ATLAS ALKOR jointed ceramic tile floor shown represents the ultimate in durable food plant floor construction.

Atlas materials represent durable construction resulting from years of research and practical experience.
Atlas service includes design, material recommendations and supervision, if desired.
Atlas will recommend tile contractors in your locality experienced in Atlas food plant floor construction.

THE Atlas Mineral Products Company
MERTZTOWN, PENNA. HOUSTON, TEXAS

*ATLANTA, GA. *CHICAGO, ILL. *DETROIT, MICH. NEW YORK, N. Y. PITTSBURGH, PA. ST. LOUIS, MO. *BERKELEY, CALIF. DALLAS, TEXAS *DENVER, COLO. *HONOLULU, HAWAII *LOS ANGELES, CALIF. NEW ORLEANS, LA. OMAHA, NEB. *SEATTLE, WASH.

*Stock carried at these points

IN CANADA: H. L. BLACHFORD, Limited, MONTREAL AND TORONTO

Schedule of Events

October

4- 6—Society of Industrial Packaging & Materials Handling Engineers. 4th annual exposition, Convention Hall, Detroit.
7—National Pickle Packers Assn., annual meeting, Sheraton Hotel, Chicago.
9-12—Master Brewers Assn. of America, annual convention, Los Angeles.
10-11—Boston Conference on Distribution, 21st annual forum, Hotel Statler, Boston.
12-15—National Assn. of Food Chains, 16th annual meeting, Statler and Mayflower Hotels, Washington, D. C.
15-20—American Bakers Assn., annual convention and baking industry exposition, Municipal Auditorium, Atlantic City.
20-22—International Assn. of Milk & Food Sanitarians, 36th annual convention, Deschler-Wallick Hotel, Columbus, Ohio.
24-26—Packaging Institute, 11th annual forum, Commodore Hotel, New York City.
24-26—National Assn. of Popcorn Manufacturers, international convention and exposition, Palmer House, Chicago.
24-28—National Safety Council, 37th national congress, Stevens, Congress and Morrison Hotels, Chicago.
26-28—Milk Industries Foundation, annual convention, Ambassador Hotel, Los Angeles.
26-28—International Assn. of Ice Cream Manufacturers, 45th annual convention, Biltmore Hotel, Los Angeles.
31-Nov. 2—American Oil Chemists Society, fall meeting, Edgewater Beach Hotel, Chicago.
31-Nov. 3—Super Market Institute, mid-year meeting, Hotel Cavalier, Virginia Beach, Va.

November

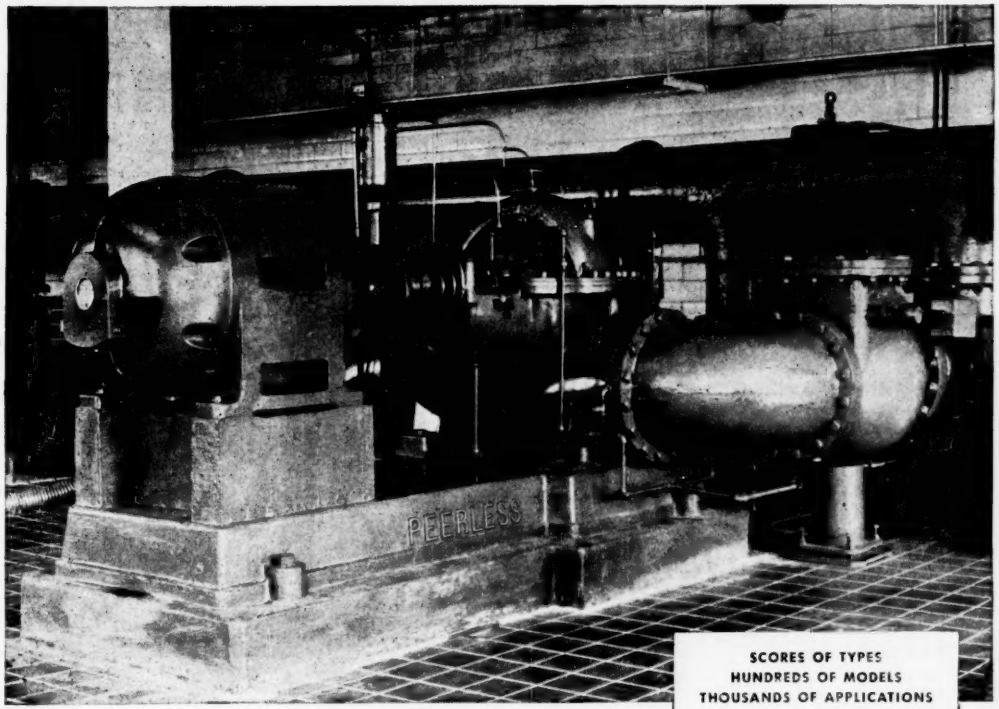
1- 5—California Section, American Chemical Society, Pacific chemical exposition and industrial conferences, Civic Auditorium, San Francisco.
2- 4—Industrial Management Society, 13th annual time-and-motion study clinic, Sheraton Hotel, Chicago.
8- 9—American Butter Institute, 41st annual meeting, Drake Hotel, Chicago.
13-17—Vegetable Growers Assn. of America, 41st annual convention, Claypool Hotel, Indianapolis.
14-16—Grocery Manufacturers of America, 41st annual meeting, Waldorf-Astoria, New York City.
14-17—American Bottlers of Carbonated Beverages, 31st national convention, Convention Hall, Detroit.
14-18—Refrigeration Equipment Manufacturers Assn., 6th all-industry refrigeration and air conditioning exposition, Auditorium, Atlantic City.
16-18—Texas Technological College, dairy manufacturers' short course, Dept. of Dairy Manufacturing, Lubbock, Tex.
27-30—National Automatic Merchandising Assn., convention and exhibit, Auditorium, Atlantic City.
28-Dec. 3—Chemical Industries, 22nd exposition, Grand Central Palace, New York.
29-30—Purdue University, 5th industrial waste conference, Lafayette, Ind.

December

5-10—Penn. State College, short ice cream course for dairy equipment and supply men, School of Agriculture, State College, Pa.

—End

PEERLESS HORIZONTAL CENTRIFUGAL PUMPS



For continuous or intermittent duty in a host of diversified services

Select the pump you need for the process you use from the diversified line of Peerless horizontal pumps. The pump shown above, a Peerless general purpose pump handling plant process water, typifies a host of efficient Peerless centrifugal pumps which are boosting output and cutting costs for manufacturers and municipalities everywhere. With its comprehensive line of horizontal pumps Peerless can handle chemicals or alkaline liquids, pump clear water or solids in suspension. There are pumps for fluids at high temperatures or they can furnish water or foam for approved plant fire protection. Peerless will move volatile butane-propane or tricky caustics and acids. Pumps are available for all practicable heads and capacities. Duty can be continuous or intermittent. Construction materials are suited to the liquid being pumped. And, backing up their installation qualified Peerless field engineering service is available in all principal cities to see that each pump matches or exceeds customer expectations. Write today for pump engineering information on your process or service. The chart at right lists a number of the types of Peerless horizontal centrifugal pump bulletins in which you will be interested.

SCORES OF TYPES
HUNDREDS OF MODELS
THOUSANDS OF APPLICATIONS

Here are a few of the services which Peerless horizontal pumps can perform. Plan with Peerless. Request copies of the Bulletins you need by Bulletin number.

Pump Service	Bulletin No.
Water Supply	B-1300
Fire Protection	B-1500
Chemicals and Oils	B-810
Vaporous Liquids	B-2201
Butane-Propane	B-2200
Boiler Feed	B-806
Sewage and Solids	B-154
Hi-Pressure	B-310
Acids and Caustics	D-2400
Process Services	B-803
All-purpose Pumps	B-2301

Peerless
VERTICAL AND HORIZONTAL
Pumps

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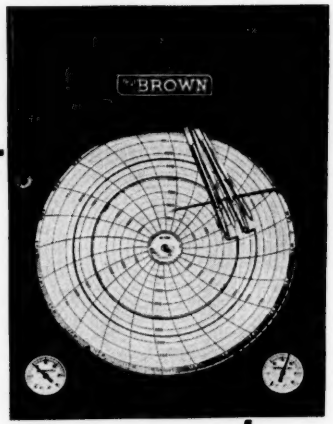
FOOD MACHINERY AND CHEMICAL CORPORATION
Los Angeles, California — Indianapolis, Indiana
District Offices: New York 5, 37 Wall St.; Chicago 40, 4554 N. Broadway; St. Louis 8, 3908 Olive St.; Atlanta Office: Rutland Bldg., Decatur, Ga.; Omaha, Nebr., 4330 Leavenworth St.; Dallas 1, Tex., 3905 Elm St.; Fresno, Calif.; Los Angeles 31, Calif.

This Little Piggie Goes to Market With Controlled Appearance and Taste...



With the Help of Brown Advanced Instrumentation

AIR-CONDITIONED SMOKEHOUSES are one of the recent great improvements in the meat packing industry . . . and new developments in instrumentation have helped make them a modern, production operation.

Processing time is greatly reduced . . . and smoke temperature and humidity are maintained at constant values, assuring uniformly high quality products.

One manufacturer of smokehouses relies on a Brown wet-and-dry bulb thermometer with Air-O-Line Control to provide precise regulation. Prescribed conditions are accurately maintained for all provisions . . . permitting unusual flexibility with substantial savings in time, labor and money.

Brown Advanced Instrumentation is effecting such economies in many other food processing operations, recording and controlling a wide range of variables. Call in your local Brown engineer, today . . . investigate *Advanced Instrumentation* for your plant!

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BROWN INSTRUMENTS DIVISION
4502 Wayne Avenue, Philadelphia 44, Pa.
Offices in 73 principal cities of the United States, Canada and throughout the world

Minneapolis Honeywell — *Advanced Instrumentation* FOR THE FOOD INDUSTRY — BROWN INSTRUMENTS

Changes in Food Supplies

Production

ICE CREAM output for July was estimated at 67,280,000 gal., 5 percent under July, 1948, and 1 percent below the 1943-1947 average for the month. The June-July increase was only 2 percent, compared with a 9 percent advance a year ago and a five-year average gain of 11 percent. Total production for the first seven months was 337,625,000 gal., off 3 percent from a year ago, but 8 percent above the five-year average.

CREAMERY BUTTER production, for July, estimated at 136,155,000 lb., was 8 percent above output in July, 1948, but 11 percent below the five-year average for the month. The June-July seasonal decline was a sharp 12 percent, compared with 9 percent last year and a five-year average seasonal drop of only 7 percent. Production for the first seven months was 17 percent above the same period last year, but 4 percent below the five-year average.

AMERICAN CHEESE production, estimated at 96,000,000 lb. in July, was 14 percent under June, though 1 percent above July, 1948, and about the same as the five-year average for the month. The June-July dip last year was 10 percent, while the five-year average was 11 percent.

OLEOMARGARINE produced during June came to 63,590,273 lb., in the compilation of the National Association of Margarine Manufacturers. The breakdown was 51,435,110 lb. of uncolored and 12,155,163 lb. of colored. The total output was a drop from the 75,869,384 lb. produced in June, 1948, although colored margarine production a year ago was only 6,385,042 lb.

Stocks

CANNED SWEET CORN held in canners' hands August 1 totaled 4,112,712 actual cases, according to the National Canners Association. This compares with 194,469 cases held on the same date a year ago. Shipments from Aug. 1, 1948, to this August 1 totaled 30,491,797 cases, compared with 27,649,431 cases shipped in the same stretch the previous year.

CANNED LIMA BEAN stocks on August 1 totaled 103,230, compared with none on the same date a year ago, in NCA's compilation. These stocks remained from a total pack of 2,598,980 cases.

CANNED BABY FOOD stocks amounted to 40,908,000 doz., on August 1, compared with 36,838,000 doz. on the same date last year.

Storage

BUTTER reserves in cold storage warehouses on August 1 were reported at 136,500,000 lb., of which 8,800,000 lb. represented government holdings, according to the American Butter Institute. This total was 64 percent larger than on the same day last year and 22 percent above the five-year average for the date.

FROZEN FISH AND SHELLFISH held in storage August 1 amounted to 127,012,907 lb., compared with 127,473,945 lb. held on the same date last year.

COLD STORAGE OCCUPANCY on August 1 continued at the lowest point on record. Public coolers were 52-percent filled, holding even with the July 1 report. This was 3 points under the previous low recorded Aug. 1, 1940. Freezer occupancy rose 2 points from July 1, standing at 63 percent filled on August 1. This was, however, 6 points under the previous low for the date, also recorded in 1940.

Indexes

The commodity index on foods, compiled by the New York *Journal of Commerce* stood at 187.0 for the week ending September 10, compared with 184.3 a week earlier, 179.9 for July, and 209.0 for September, 1948.

Business Week's index of business activity was 184.8 for the week ending September 3. A week earlier it stood at 183.9; a month earlier, 181.0; and a year earlier, 194.8.

CONSTRUCTION

	Pending (thousands)	Awarded Sept. (thousands)	Total Awarded 1949 (thousands)
Bakery	$90	$855	$6,278
Beverages	2,104	250	11,457
Canning and Preserving	75	.....	115
Cold Storage	.....	.....	1,883
Confectionery	.....	.....	1,008
Grain Mill Products	743	1,772	20,006
Ice, Manufactured	.....	.....	75
Meats and Meat Products	300	.....	7,547
Milk Products	865	306	4,361
Miscellaneous	1,440	981	13,498
	$5,617	$4,164	$66,228

THE FLEISCHMANN LABORATORIES
Research Headquarters For Natural Yeast Products

Baby Food Hits Jackpot!

A LEADING processor reports his fortified baby food an instant success. One low-cost nutritional fortifier pepped up product... sparked advertising and sales.

Get the facts! Follow the trend to fortified foods. One of our technical men will be pleased to consult with you. No obligation! Special Products Division, STANDARD BRANDS INCORPORATED, New York 22, N. Y.

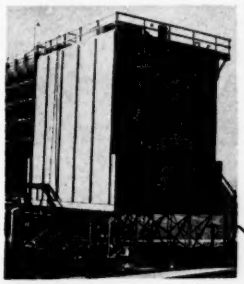
VITAMIN D PRODUCTS: Hy-Dee Irradiated Dry Yeast, Irradiated Dry Yeast Type 700-H; Viosterol (Irradiated Ergosterol).

NATURAL B-COMPLEX PRODUCTS: Pure Primary Dry Yeast (brewers' type), Bee-Flex Products, Yeast Extracts, Yeast Extract and Liver, Fortified Yeast with Iron.

MALT EXTRACTS AND SYRUPS: A complete line of dry and liquid diastatic and non-diastatic malt extracts and malt syrups.

Fleischmann's
"First For Food Fortification"

"Our best ads are installed..."



Two cell induced draft cooling tower.

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- LOW WATER CONTROLS
- STRAINERS, RELAYS
- PORTABLE EQUIPMENT CONTROLS
- MACHINE TOOL CONTROLS

GENERAL CONTROLS

Manufacturers of Automatic Pressure, Temperature, Level & Flow Controls

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HUNTING FOR GLYCERINE?

Armour has it as close as your phone. Just call the nearest of Armour's 332 convenient stock points for all grades. Quick delivery keeps your inventories low.

ARMOUR *Glycerine Division*

Armour and Co., 1355 W. 31st St., Chicago 9, Ill.

What Washington Thinks

By R. S. McBride, Washington, D. C.

CO-OP SALES PRACTICE—Farm Credit Administration has surveyed the marketing practices of co-ops that deal in canned or frozen fruits or vegetables. Seventy such agencies were studied, which do about 80 percent of this kind of business.

These co-ops market more than 60 percent of their processed products under their own brands. Price is usually determined at the beginning of the season by adding to prospective packing cost a "sufficient margin" to provide "a fair return to growers." More than half of the sales are by contract. About three-fourths of the sales are through brokers. Nearly all (about 95 percent) are sold f.o.b. shipping point.

These policies represent activity in a field that produces over 30,000,000 cases of canned goods and over 50,000,000 lb. of frozen products. Worth noting!

SMOTHERING—Packaging of certain fruits and vegetables in tight containers may cause smothering. Recent studies with cranberries demonstrate a very satisfactory keeping quality of the berries in a retail cellophane perforated bag if kept several weeks refrigerated at temperatures from 33 to 38 deg. F. After that long cold storage, the fruit can be kept without refrigeration for several days, or sometimes for as much as a week during retail sale and in the kitchen.

All that fine performance is destroyed, however, when non-perforated bags are tightly heat-sealed. Such "superior" packaging, which is very desirable for some commodities, smothers the fruit and causes early rotting. Any technologist packaging vegetable material that contains live cells must remember this hazard of smothering.

CONGRESSIONAL INQUIRY—There has been so much talk regarding adulteration of foods by chemicals—residues from chemical additions or chemical-sprays—that many Congressmen have become convinced that a formal investigation is essential. The greatest impetus to enactment by the House of Representatives of a resolution of inquiry came when Representative Sabath, powerful chairman of the Rules Committee, introduced H. Res. 323 in language substantially like the earlier Keefe resolution H. Res. 207.

Ultimately, we shall have perhaps a year of controversy over the many phases of insecticides, fertilizers, chemicals, and foods. The industry might as well get ready to carry on in as good humor as possible while the Washington commotion continues over these wide, but related, fields. It will be a battle of giants, and no one can even guess the ultimate outcome.

BE CAREFUL!—The Bureau of Plant Industry has been trying to fix cauliflower so that it will stay attractive and marketable longer. One of its suggestions has caused cold shivers along the spine of Food & Drug Administration. The idea is that the heads of cauliflower with leaf attached should be sprayed with 2,4-D or with napthaleneacetic acid, nick-name NA.

Preservation of attractive appearance is not doubted. But the food law boys feel that such chemical spraying is certainly going to carry through to the kitchen in many cases. And who wants to eat either 2,4-D or NA? There may be some practical application of the new knowledge developed. But meantime let's hope that nobody gets a generous dose of these spray residues, no matter how attractive the cauliflower may be.

WHO DONE IT?—In short, who made that recommendation of chemical processing that you are thinking about using? Frequently, agricultural researchers and zealous bug chasers in the state and college laboratories start an idea like the one on cauliflower just described above. It is up to the food technologist to be sure that such recommended practices don't have a secondary hazard. Palatability is desirable. But palatability via poison is not to be recommended safely.

WHY LOW QUALITY—Frequent complaint has been made to the Department of Agriculture by cherry processors that first quality products could not be made despite apparent good quality of most of the fruit used. Extended field study by Production & Marketing Administration offers three explanations of the processors' difficulties: 1. Irregular quality of cherries has caused difficulty because inspection methods do not always reject the low quality material intermingled with the good. 2. In many plants, packing and sorting tables have been of inadequate length or operated so fast that sorters could not remove a suitable percentage of defective fruit. 3. After grading in the factory, poor lots and good lots are frequently so intermingled as to preclude first quality product manu-

facture from the first quality raw material.

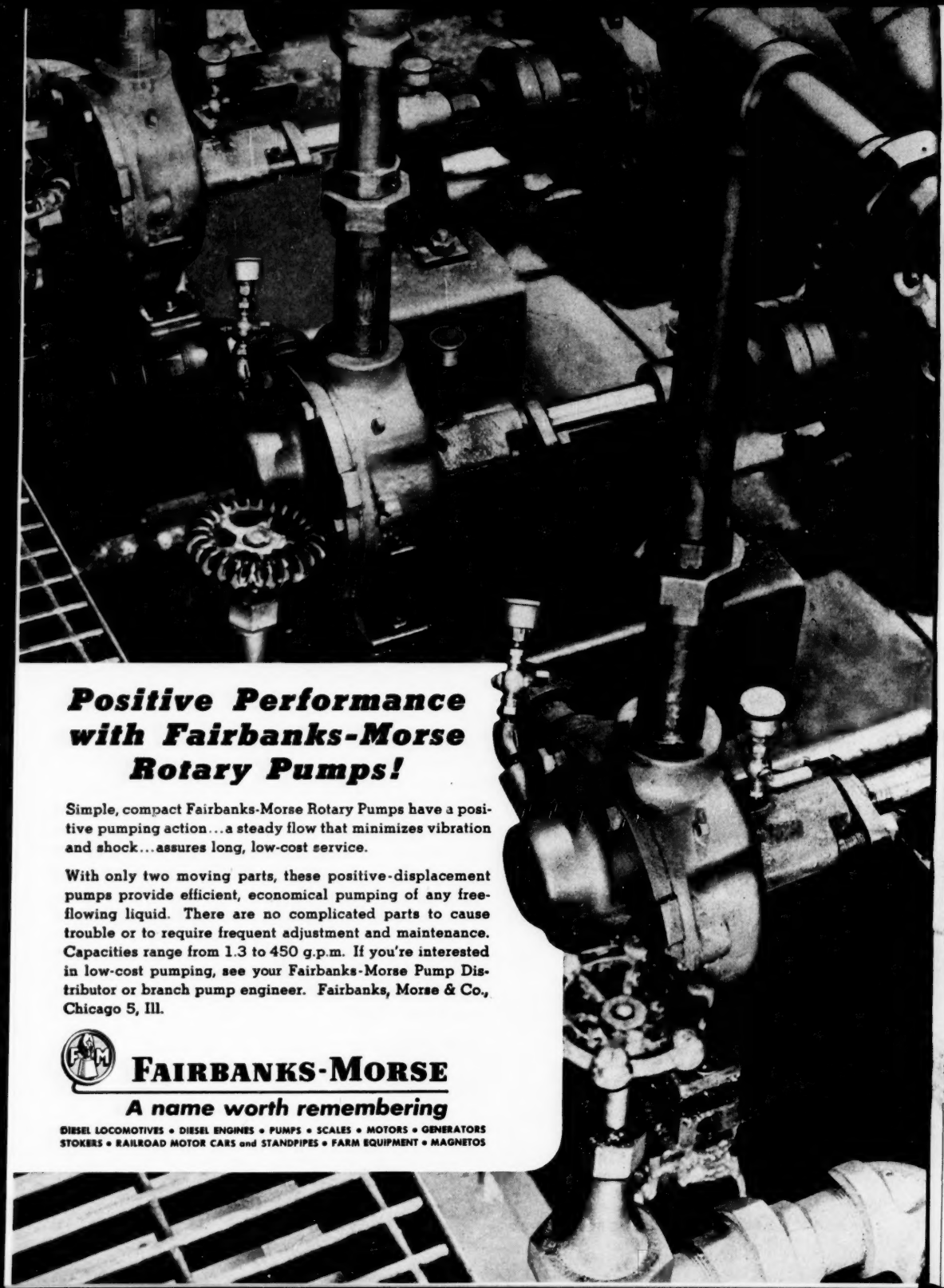
These almost obvious defects in plant methods apparently occur widely, and they appear likely in other food processing establishments as well as those handling cherries.

PRESERVATIVES PERMITTED—Addition of preservatives like sodium benzoate to meat products is generally not permissible. Recently, this fact raised a question as to whether minor ingredients used in meat-products plants were forbidden because they happen to contain traces of sodium benzoate, benzoic acid, sodium sulphite, or sulphur dioxide. Bureau of Animal Industry has ruled definitely that the traces of preservative in these minor ingredients do not prevent their use in such meat-containing products as soup, hash, stew, and like material. Furthermore, it is not required that the trace of preservatives so put into the meat product be declared on the label. This sounds like good sense.

DISAPPOINTING NEWS—Housewives have been told by daily paper headlines and stories, inspired in Washington, that there will be more turkey available for Thanksgiving this year. The inference was that prices would be more reasonable for the holiday's piece de resistance. Then along comes Uncle Sam's spokesman and announces that Commodity Credit Corp. is going to buy enough turkeys to support the price between August 1 and December 28. It looks as though we will have to have cheaper turkey next year, if at all. Incidentally, the government purchasing is also scheduled for July, 1950. So Thanksgiving next year may leave us no better off than this.

SUBPENA POWER—Food & Drug Administration has definitely backed the proposal that it be given power to subpena witnesses and pertinent documentary information such as is required to complete a record in a standards proceeding. The purpose is to insure that any decision on standards and similar official findings may be based on a complete technical record, even though certain individuals or companies are reluctant to come and testify. The move has been opposed by outstanding industry spokesmen on the ground that the original draft of the bill gave far more authority to the Food & Drug Commissioner and the Administrator of Federal Security Agency than was either necessary or proper. Early legislative action is not expected.

A Beautiful Package!
QUICK...
CLEAN...
and COLORFULLY SEALED
with WARE HEAT SEAL
Ware Heat Seal has been developed for the clean, fast application of labels to a variety of surfaces including film-wrapped food products. This odorless paper lends itself to colorful printing, giving you both economical and effective identification. Once applied to these surfaces, a Ware Heat Seal is permanent. Inquiries for descriptive literature are invited.
McLAURIN-JONES COMPANY
BROOKFIELD – MASSACHUSETTS
A McLAURIN-JONES Product
OFFICES: NEW YORK – CHICAGO – LOS ANGELES
Bond
ALL-CHOCOLATE RING
Kroger
FIG BARS
19¢
For Top Labels, Closure Labels and a multitude of other applications. Can be furnished in Super Finish or Mirror Finish Waretone.
WARDS
TIP-TOP
CAKES
WINE LOAF
20¢



Positive Performance with Fairbanks-Morse Rotary Pumps!

Simple, compact Fairbanks-Morse Rotary Pumps have a positive pumping action...a steady flow that minimizes vibration and shock...assures long, low-cost service.

With only two moving parts, these positive-displacement pumps provide efficient, economical pumping of any free-flowing liquid. There are no complicated parts to cause trouble or to require frequent adjustment and maintenance. Capacities range from 1.3 to 450 g.p.m. If you're interested in low-cost pumping, see your Fairbanks-Morse Pump Distributor or branch pump engineer. Fairbanks, Morse & Co., Chicago 5, Ill.

FAIRBANKS-MORSE

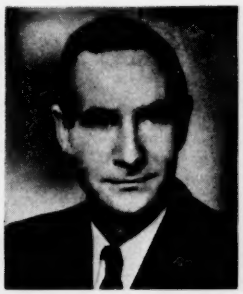
A name worth remembering

DIESEL LOCOMOTIVES • DIESEL ENGINES • PUMPS • SCALES • MOTORS • GENERATORS
STOKERS • RAILROAD MOTOR CARS and STANDPIPES • FARM EQUIPMENT • MAGNETOS

Men, Jobs, Companies

FRANK D. GREEN, formerly in charge of industrial relations with Armour & Co., Chicago, has been named general superintendent of company plants, in accordance with recent operating division changes.

ALBERT P. BROWNE, recently elected president of Rainier Brewing Co., San Francisco and Los Angeles. He is a chemical-engineer graduate of U. of Oregon and Wahl-Henius Brewing Institute, Chicago.



JOHN S. GOLDSMITH has been promoted to assistant to vice-president in charge of all food production at John H. Dulany & Son, Inc., Fruitland, Md. A graduate of U. of Maryland, he has been with firm over 9 yr.

DR. JOHN R. MATCHETT, food research coordinator, Western Regional Research Laboratory, Albany, Calif., has been appointed special assistant to Chief of Bureau Agricultural & Industrial Chemistry, Washington, D.C.

Industry

Canadian Canners Ltd., Hamilton, Ont., announces appointment of G. H. Gausby, Leonard Phillips, and J. A. Seythes as directors of firm.

Canadian Food Products, Ltd., Toronto, Ont., reports election of R. T. Hartt as director and president of company. Until recently, he had been vice-president and general manager of Zeller's, Ltd., Montreal.

Columbia Co-Operative Warehouse Assn., Columbia, Mo., was recently liquidated after 26 yr. of business. Shares originally purchased at $20 were redeemed at $300 each. Business will be continued by Clyde Hinshaw, who has been manager of the co-op for 19 years.

Craighead Rice Milling Co., Jonesboro, Ark., will erect a $60,000 addition to its rice dryer and elevator.

Coleman Canning Co., Coleman, Wis., has placed its new cannery in operation at Gladstone, Mich.

Co-operative Grange League Federation Exchange, Inc., with headquarters at Ithaca, N. Y., is liquidating its canning activities and will sell its canneries at Waterloo, N. Y.

Domino Canning Co., Inc., a Florida corporation in which S & W Fine Foods, Inc., San Francisco, is majority stockholder, has acquired all assets of Domino Canning Assn., Bradenton, Fla.

Fred M. Drew Co. has been incorporated, with $250,000 capitalization, to operate a canning business in San Jose, Calif.

J. H. Dulany & Son, Inc., Fruitland, Md., announces that J. J. Whittington has been promoted to plant manager of firm's Exmore, Va. plant. W. J. Hart, Jr. has been appointed chief technologist responsible for research, development and quality control.

Floridagold Canning Plant, Winter Haven, Fla., reports speeding up operational lines to increase production to 50,000 cases daily.

Golden State Co., Ltd., San Francisco, announces plans to participate in operations of Industria Lacteo do Carabobo, a new company for the processing and distribution of dairy products in Valencia, Venezuela.

Hitching Post Foods, Inc., has consolidated all plants and offices in Savannah, Ga.

Hunt Foods, Inc., Los Angeles, has acquired a 40,000 sq. ft. warehouse in Brooklyn, N. Y.

Inland Products, Inc., has been formed in Columbus, Ohio, through the merger of four local rendering firms having combined sales of more than $8,000,000 yearly.

Monsanto Chemical Co., St. Louis, has established new food technology laboratories in the phosphate division research department, Anniston, Ala. New technologists include: Dr. Roy E. Morse, T. W. Schilb, and Elizabeth McKim.

National Biscuit Co. has taken a long term lease on a new $100,000 plant at Dayton, Ohio.

Peller Brewing Co. of Hamilton, Ont., Canada, will soon be operating a new $1,000,000 brewing plant in Three Rivers, P. Q.

Pillsbury Mills' new pre-mix plant at Springfield, Ill., was recently placed in operation after a two-year construction program.

Royal Packing Co., St. Louis is reported doubling size of its plant.

Shedd-Bartush Foods, Inc., is new name of firm formerly known as Wheatley Foods Co., with plants in Louisville; Terrell, Tex.; and Jacksonville, Fla.

Swift & Co. recently opened a new solvent extraction plant at its soybean mill in Champaign, Ill. The packing firm also recently granted $10,000 to the physiology department of U. of Chicago, to study effects of diets on sleeping habits of infants.

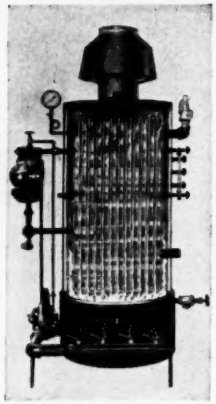
Vacuum Foods Corp. has acquired Ridge Citrus Concentrate, Inc., at Davenport, Fla., for processing of its Minute Maid frozen orange juice.

The Woodman Co., Avondale Estates, Ga., announces sale of its food chem-

(Men, Jobs, Companies Continued)

MEETS THE FULL MEANING OF THE TERM . . .

"PACKAGED UNIT"



The KANE Boiler is built to A.S.M.E. specifications, in sizes to 30 H.P.

the Kane Boiler Package

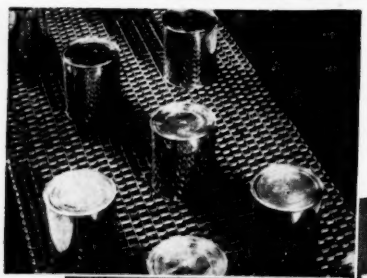
Each KANE BOILER PACKAGE is carefully considered by us as an "individual" job —from the customer's requirements to the finished unit. And each BOILER PACKAGE is a compact, self-contained steam source that includes: the correctly sized KANE Automatic Gas-Fired Boiler complete with gas burner and controls to maintain required steam pressure; and an M-K-O Automatic Boiler Feed system designed to return condensate and supply make-up water as required for highest operating efficiency. Engineered Steam at its best with four decades of experience at your disposal—so, send your steam problem to us for study and recommendation.

ENGINEERED STEAM AT ITS BEST

MEARS·KANE·OFELDT INC.

1903-1915 EAST HAGERT STREET, PHILADELPHIA 25, PA.

FOUR DECADES OF AUTOMATIC GAS-FIRED BOILER MANUFACTURING EXPERIENCE



LA PORTE

FLEXIBLE STEEL CONVEYOR BELTING

Cuts Food Handling Costs

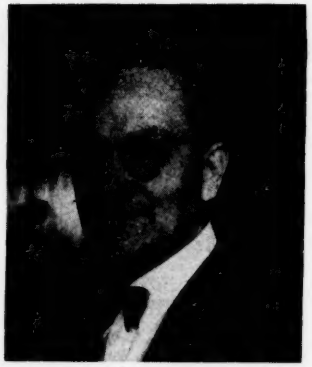
Today more and more food plants are installing this long wearing Conveyor Belting to offset rising production, maintenance and replacement costs.

- It resists impacts, wear, heat, cold and rust.
- It grips the friction drum, eliminating creeping, weaving, jumping and rubbing on pulley stands.
- Permits circulation of air, water or heat around products in process and sterilizing with steam or scalding water. • Its perfectly flat surface provides for the safe handling of glass, tin or paper containers, empty or filled. • It is one belt for every process.

You can save money with La Porte Flexible Steel Belting. It is available in any length and practically any width. Write at once for literature and prices.

LA PORTE MAT & MFG. CO.

BOX 124 LA PORTE, INDIANA



FRED C. BASELT has been appointed assistant director of research for American Can Co., New York City. He will have direct charge of all activities in research and development work with firm's beer cans and flat-top paper milk containers.

istry division to Mr. L. L. Antle, who has formed a firm under his own name to manufacture and distribute antioxidants.

J. Weingarten, Inc., of Houston, operator of 22 supermarkets, has opened a new $100,000 ice cream plant to service these stores.

Personnel

Charles E. Baker, Jr., former manager of Omar Inc., flour and feed mill, Omaha, is now general superintendent, Lindsey-Robinson & Co., Inc., Roanoke, Va.

Franklin C. Bing, scientific director and secretary of board of directors of American Institute of Baking, Chicago, has resigned this position to devote his full time to research and teaching.

J. L. Butz has been appointed comptroller for western division of Kraft Foods Co., with headquarters in San Francisco.

Milton S. Eisenhower, president of Kansas State College, Manhattan, has been elected a director of Quaker Oats Co., Chicago, to replace John P. Welding, resigned.

Henry A. Lardy, associate professor of biochemistry at U. of Wisconsin, has been awarded the $1,000 Paul-Lewis Laboratories Award in Enzyme Chemistry for his work in discovering

(Men, Jobs, Companies Continued)

FROM COLD CUTS

TO ICE CREAM

Nothing takes the place of Glycerine

Because it combines easily with other materials . . . it absorbs and retains moisture . . . it does not evaporate easily . . . it is an excellent solvent, particularly for flavoring oils . . . and an effective anti-freeze—USP glycerine enjoys wide application in the food industry.

Where is it used? In ice cream . . . in chewing gum . . . in peanut butter . . . cake . . . meat seasoning compounds and many other food products—doing a wide variety of jobs: preserving, retaining freshness, improving texture and acting as a useful ingredient to prevent hardening in gelatin-base products. USP glycerine is easily digestible and energy-producing, not unlike conventional sugars and fats. It offers a unique combination of physical and chemical properties that cannot be matched by any other product!

That's why—for our daily food staples and in a great number of newly developed food products—*Nothing takes the place of glycerine!*

GLYCERINE PRODUCERS' ASSOCIATION
295 Madison Avenue, New York 17, N. Y.

Technical GLYCERINE NEWS

A UNIQUE COFFEE CONCENTRATE is said to preserve its aroma until used, according to a recent patent. A specially prepared powdered concentrate is added to freshly ground coffee which has been impregnated with glycerine. It is claimed that the resultant concentrate can be used in small cotton bags to make coffee of full flavor. (F-17)

★ ★ ★

REVISED GLYCEROL VISCOSITIES TABLE AVAILABLE. A new table of the viscosities of glycerine in aqueous solution from 0 to 100 per cent, at from 0 to 100 degrees C. has been prepared by the Research Laboratories of Glycerine Producers' Association. Write for your copy. (F-18)

★ ★ ★

CANDY MANUFACTURERS USING CERTIFIED FOOD COLORS will find that glycerine is not only an excellent solvent and suspending agent for FD&C colors but also an effective preservative as well. Where a color solution is to be kept for any length of time, it is advisable to add 25% of glycerine by volume or 32 ounces per gallon of water. (F-19)

★ ★ ★

GLYCERINE SECTIONS OF BEILSTEIN TRANSLATED! Now available for the first time, an English translation of the Glycerine Sections of Beilstein's famous *Handbuch der Organischen Chemie* (4th Edition). Complete in *one* volume entitled "GLYCERINE AND SOME GLYCERINE DERIVATIVES."

Publication authorized by the Attorney General of the United States. Compiled and edited by Dr. R. N. DuPuis, Dr. C. S. Miner, Jr. and J. B. Segur—long acknowledged as authorities in the field of Glycerine and its properties. Amassed in its 210 pages are an unusually large number of Glycerine derivatives with extensive cross-references. Also included are a complete table of contents and a detailed index of the derivatives and fatty acid esters of Glycerine. A timely, comprehensive volume for your chemical reference library.

Order from the Glycerine Producers' Association enclosing $2.50 (check or money order) for each copy.

GLYCERINE PRODUCERS' ASSOCIATION, DEPT. 8
295 MADISON AVENUE
NEW YORK 17, N. Y.

I should like to know the source of those items appearing in Technical Glycerine News which I have checked below.

☐ F-17 ☐ F-18 ☐ F-19

NAME .....

COMPANY .....

ADDRESS .....

Colson
LIFT-JACK Systems
Save Time,
Money, Effort
Put new hustle in your materials-handling with Colson Lift Jack Systems. Through production, in and out of storage, on and off freight cars, one Colson Lift Jack with wood or steel platforms does the work of many conventional hand trucks, saves time & money.
Other cost-cutting Colson equipment includes drum and barrel trucks, platform trucks, hand trucks and famous Colson load-floating wheels and casters.
Colson Lift Jack with Wood Skid
Write Today For Free 56 Page Catalog
THE COLSON CORPORATION
ELYRIA, OHIO
CASTERS • • LIFT JACK SYSTEMS • • INDUSTRIAL TRUCKS

essential role of biotin in maintenance of animal health.

W. Francis Rowe, former plant superintendent of Colorado Milling & Elevator Co., Denver, has been appointed manager of firm's new plant in Omaha.

Leonard S. Slaughter has been elected vice-president in charge of ice cream operations of Telling-Belle Vernon Co., Columbus, Ohio.

Fred B. Speyer has been appointed product development specialist in chemical department of General Mills' new products commercial research organization.

O. H. Starnes, Jr. is new general manager of Florida division of Pomona Products Co.

E. H. Throm, recently retired on a pension from Sperry & Barnes Co., New Haven, Conn., after 48 yr. of continuous service.

Charles H. Wallace has rejoined Cleveland Provision Co. as vice-president and general manager. He had left the firm in 1946 to become president of Portage Frosted Foods, Inc., at Ravenna, Ohio.

Louis F. Watermulder, formerly treasurer of Quaker Oats Co., Chicago, has been appointed administrative vice-president of Lever Brothers, Cambridge, Mass.

Associated Industry

Allis-Chalmers, Milwaukee, has appointed J. F. Fitzsimmons manager of commercial research department to succeed J. R. Reed.

American Can Co. announces appointment of C. Stuart Hall to newly created post of assistant to the president.

Atlas Mineral Products Co., Mertztown, Pa., recently dedicated its new research laboratories, which will be staffed by twelve chemists under the direction of Dr. R. B. Seymour and Joseph Dahle.

Baker-Raulang Co., Cleveland, reports appointment of R. H. Davies as supervisor of all engineering functions.

Brown Instruments Div. of Minne-

(Men, Jobs, Companies Continued)

ANNOUNCING 6" DIAMETER PYREX BRAND GLASS PIPE!

To its regular line of 1", 1½", 2", 3" and 4" PYREX brand Glass Pipe, Corning adds a new 6" diameter. It is available in standard lengths of ten feet. Six inch fittings include elbows, tees, crosses and reducers.

Balanced stocks of PYREX brand glass pipe and fittings in all sizes are maintained and shipments can be made to any point quickly after orders are received.

CORROSION CONTROL AT LOWEST COST

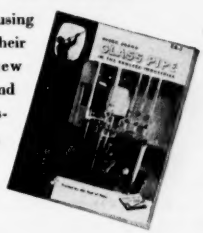
A recent survey taken among users of PYREX brand Glass Pipe shows that it is considered the lowest cost piping material with which to control corrosion. There are over twenty years of satisfactory experience *behind* the product.

MAKE THIS SIMPLE TEST

If you haven't had any experience in using PYREX Pipe in your process lines, make a modest test installation! It can be assembled to any other piping or process equipment by means of adaptor flanges. This simple test will show how practical PYREX Pipe is, not only in combating corrosion but also in giving you longer service plus visibility and easy cleanability.

NEW INSTALLATION BULLETIN!

SEE HOW OTHERS ARE using PYREX brand Glass Pipe in their operations. Write for the new Corning booklet, "PYREX brand Glass Pipe in the Process Industries." Use convenient form below.



CORNING GLASS

PYREX

PLANT EQUIPMENT SALES DEPARTMENT

CORNING GLASS WORKS, CORNING, N. Y.

TECHNICAL PRODUCTS DIVISION: GLASS PIPE • SIGNALWARE • LABORATORY GLASSWARE • GAUGE GLASSES • LIGHTINGWARE • OPTICAL GLASS • GLASS COMPONENTS

CORNING GLASS WORKS, Dept.FI-10, Corning, N. Y.

☐ We are interested in 6" PYREX brand Glass Pipe. Send full particulars.

☐ Send copy of booklet, "PYREX Pipe in Process Industries."

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

FMC FLAT TOP STEELBELT

Made of No. 302 (18-8) stainless steel

We'll gladly send a sample of this all-purpose STEELBELT, used for conveying every kind of product. See for yourself how rugged it's made, how easy to splice, how flexible in operation, how easy to clean.

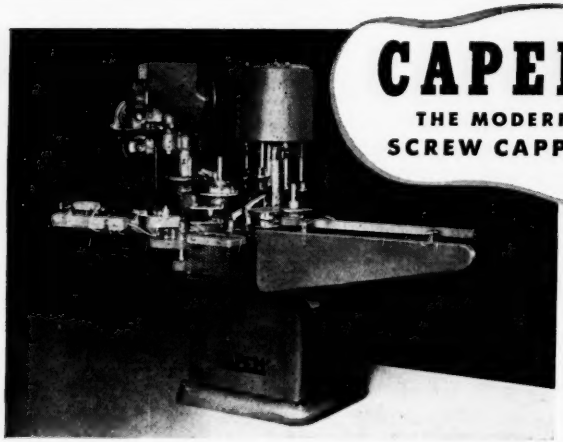
FOOD MACHINERY AND CHEMICAL CORPORATION

ANDERSON-BARNGROVER DIVISION General Sales Office SAN JOSE 5, CALIFORNIA

SEATTLE • PORTLAND • LOS ANGELES • HOOPESTON, ILLINOIS (SPRAGUE-SELLS DIVISION)

CAPEM

THE MODERN SCREW CAPPER



- Applies any type of standard screw cap or cover at speeds of 2,000 to 10,000 per hour.
- Takes container from conveyor line, applies cap perfectly, and returns container to conveyor AUTOMATICALLY without intermediate handling.
- Handles bottles, jars, cans or jugs of any size or shape.
- Delivers a perfect, LEAKPROOF seal at low cost.
- Available in 1, 2, 4, 6 and 8 spindle models.

Write for prices and delivery.

CONSOLIDATED PACKAGING MACHINERY CORP.

BUFFALO 13, N.Y.

Men, Jobs, Companies

apolis-Honeywell Regulator Co. has named G. E. Gilliam to manage national pyrometer supply sales.

Cochrane Corp., Philadelphia, announces appointment of Samuel B. Applebaum as manager of cold process water treating division.

Diversey Corp., Chicago, reports appointment of S. E. Alvis as manager of its central division.

Fairbanks, Morse & Co., Chicago, has appointed F. M. Mason, Jr. as director of engineering, to be located at firm's headquarters.

McLaurin-Jones Co. of Brookfield, Mass., has purchased business formerly operated by Grand River Paper Corp., Grand Rapids, Mich.

Chas. Pfizer & Co., Inc., Brooklyn, N. Y. has named J. J. Thompson as manager of newly formed food, beverage and feed sales division.

Refrigerated Foods Engineering Ltd., Vancouver, B. C. announces that P. E. Paulson has joined company as vice-president and managing director.

Schaefer, Inc., Minneapolis ice cream cabinet manufacturer, has elected B. W. Hanson as president. He has been vice-president and treasurer.

Deaths

Hugh Ross Adams, 70, vice-president of Fruit Industries, Ltd.—in Presbyterian Hospital, Chicago, Aug. 26.

Herbert J. Bird, 72, former president of American Butter Institute—at Neebish Island, Mich., Aug. 7.

E. J. Burnell, 61, vice-president and general sales manager of Link-Belt Co., Chicago—at his home in Winnetka, Ill., July 22.

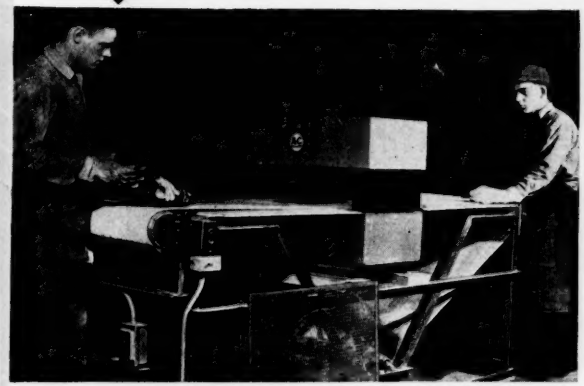
E. A. McIlhenny, 77, president of McIlhenny Co., the manufacturer of Tabasco sauce—at his home on Avery Island, New Iberia, La., Aug. 8.

Harry Meinhold, 86, president of Duffy-Mott Co., Inc.—at Roosevelt Hospital, New York City, August.

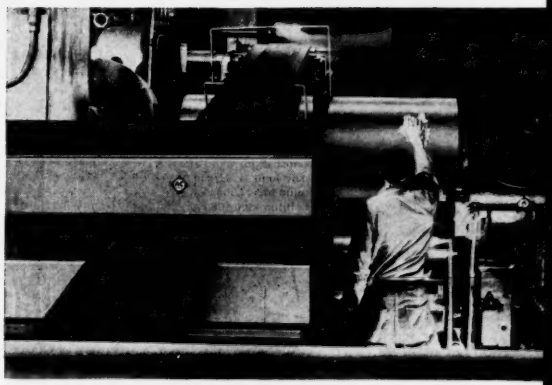
Lillian E. Raymond, 86, president of Raymond Brothers Impact Pulveriser Co., Chicago—in Evanston, Ill., Aug. 27.

—End

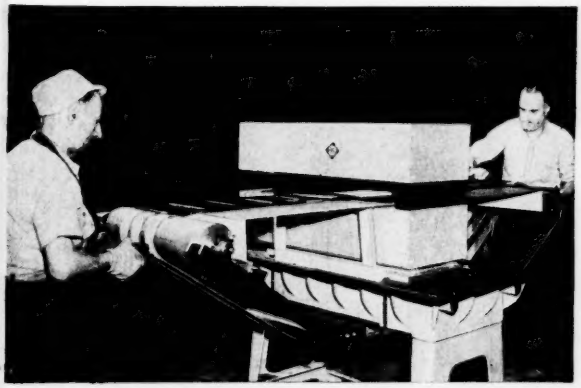
Four Cases from Diary of Metal Detector Engineer



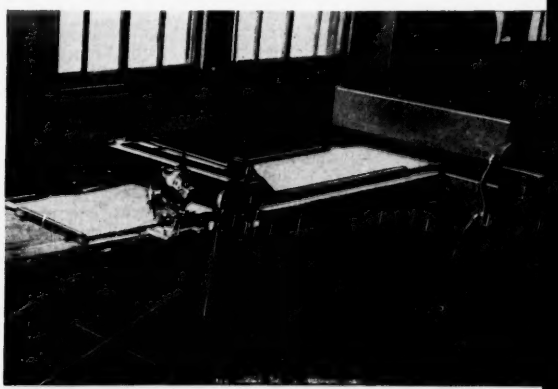
$8,000 LOSS — Saw some damaged calender rolls in a plastics plant. One had to be scrapped . . . the others could be ground down. All caused by a workman's screwdriver. Using this detector, loss would have been avoided, unit would have paid for itself several times over.



$2,000 SAVED — A real thrill today! Started up the new Metal Detector for the customer and 30 minutes later it spotted a piece of tramp metal. The conveyor was stopped instantly. Customer figures the unit paid for itself by saving a calender regrinding operation estimated at $2,000.



SAVED $1,274 IN 21 DAYS — Phonograph record maker showed me their reports for first 21 days operation of their Electronic Metal Detector. They're detecting metal in plastic biscuits before they reach matrices. Inspected 124,994 biscuits. Found 182 containing metal. Saved 182 matrices at $7 each.



STOPPED CUTTER BREAKAGE — Checked installation of plastic tray maker. He reports damage to cutters eliminated. Occasionally one of the thousands of needles used in the felting process breaks. Now, if a needle breaks in the plastic, the conveyor is stopped — and the contaminated area is removed.

SPOT MAGNETIC OR NON-MAGNETIC METAL PARTICLES — Pieces as small as .039 of an inch in diameter are located by the Allis-Chalmers Electronic Metal Detector regardless of how deeply embedded. Systems may be arranged so that when metal is detected: 1. conveyor is stopped, 2. automatic rejection device is actuated, or 3. an alarm signals for manual removal of contaminated article. Handles belts to 24" wide at speeds from 15 to 600 fpm. Aperture heights: 2", 4", 7" and 12".

ALLIS-CHALMERS

ALLIS-CHALMERS, 1113A SO. 70 ST. MILWAUKEE, WIS. A-2823

Please send more information about Metal Detectors.

Name.....

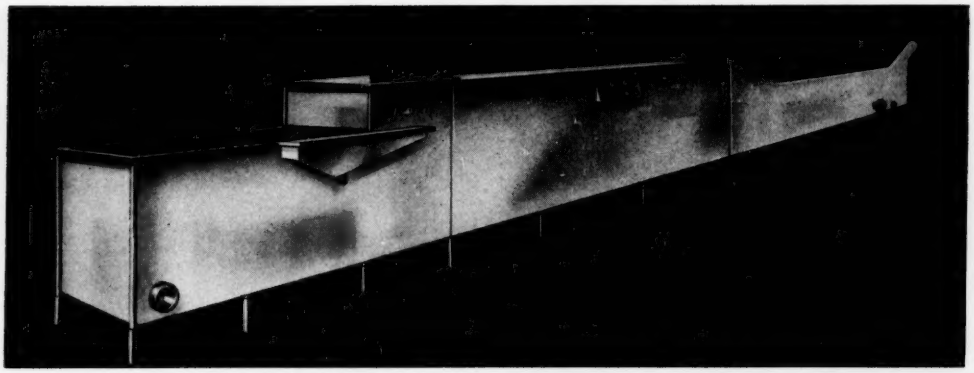
Title.....

Company.....

Address.....

City.....State.....

Food Equipment News



Super-Heat Peeler Operates Off Regular Steam Line

Fruits and vegetables are swiftly and effectively peeled by a new compact vapor peeler using superheated steam at temperatures of 650 deg. F. up to 1,000 deg. F.

It operates from the plant's regular steam lines, generates its own superheat, has a high capacity, and lowers operating labor costs.

Excellent peeling results are reported—thinner skins removed and pre-cooking reduced with one quick application of the superheated steam.

The peeler is 4 ft. wide by 15 ft. long, and it consists of a closed insulated tunnel through which the products pass on a conveyor. Seals are provided at the entrance and exit to prevent escape of steam. Heating surfaces and steam orifices are directly over the product and conveyor. For accurate exposure control, a variable speed drive is used on the conveyor.

Rated capacity of the peeler is 6 tons per hour. Equipment utilizes steam under usual cannery steam conditions from 80 to 175 psig. (i.e., prevailing pressure. See steam system diagram). A steam separator removes moisture entrained in the steam from the house supply. This provides dry-saturated steam, which is then superheated, in the first stage of a two-stage superheater, to the desired temperature (950 deg.). This high-temp steam is passed through a series of extended heating surfaces directly over the product conveyor.

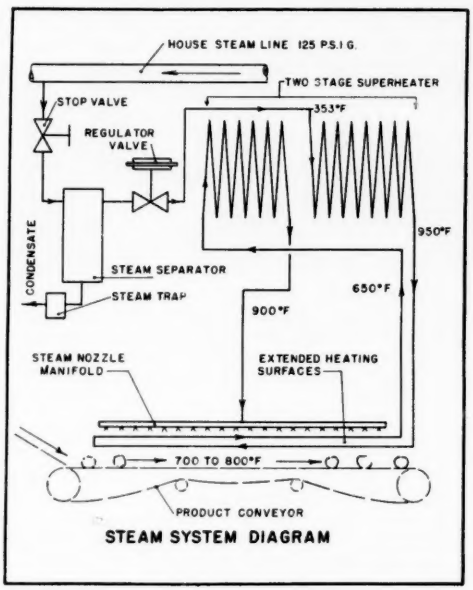
Due to the heat absorption by the product, and other losses, the steam leaves the surface at approximately 650 deg F. Steam is now returned to the second stage of the superheater and again raised to approximately 900 deg. F. It is then passed to the steam orifices, or nozzles, directly over the extended surfaces onto the product moving on the conveyor. This method provides a uniformly high-temp atmosphere and accurate control of both steam temperature and the temperature of the tunnel atmosphere.

In developing this machine, the company ran a series of tests. The first was conducted to determine the effect of temperatures on peeling. Whereas existing peelers operate at temperatures from 240-350 deg. F., a test range of 300 to 600 deg. F. was chosen, thus giving a starting point within the present range and carrying higher for the experimental purposes. An exposure time of 50 sec. held throughout.

Tomatoes could almost be slip-peeled at the lower temperature, indicating that for this temperature, the exposure was too short. The skin was thick on those which could be slip peeled, and there was some sticking on most samples.

Temperature was increased by 50-deg.-F. intervals, with samples run at each temperature. Improvement could be noted at each increase, until the upper limit previously set was reached.

In the range between 475 and 650 F., many samples were completely peeled, requiring little or no additional handling. The results of higher temperatures indicated that shorter exposure could be used to advantage.



STEAM SYSTEM DIAGRAM

This was promptly investigated, with samples of tomatoes run at temperatures up to 850 deg. F. and exposure time brought down to 8 sec. Skin removed was much cleaner, having no adherences, and the fruit remained firm. Only very minor evidence of heat penetration was noted. These tests were subsequently repeated and verified.

Pears, carrots, new and old potatoes, bell peppers, red beets, and onions were tested. Each product required different conditions.—*Atlas-Pacific Engineering Co., 1321 67th St., Emeryville, Calif.*

Unit Automatically Diverts Packages

Uniform width commodities that have one flat, smooth riding surface, and are traveling in a single line can now be automatically diverted into two lines by a new unit.

Known as the Auto Diverger, it will take cases coming end-to-end from a single line and divide them into two lines in whatever proportion is desired. Electric eyes across the receiving lines keep each of them filled to the capacity required.

If the demand is greater on one line, then that line will automatically receive cases in an amount equal to its requirements. Thus, each of the receiving lines will be kept filled regardless of fluctuations in demand for cases.

The diverger should be fed by a horizontal power conveyor, either belt or live roller, with a speed to suit the capacity desired. Receiving conveyors should be of gravity type to permit accumulation of commodity.—*Standard Conveyor Co., North St. Paul 9, Minn.*

Lubricants Delivered at Constant Pressure

A new weight-loaded lubricator has been designed to deliver lubricant at constant pressure in any desired quantity. For use with both greases and oils, it is reported to decrease maintenance costs, improve equipment operation, and lengthen machinery life.

Typical uses are application of lubricant to: Stuffing boxes of pumps and mixers, motors and engines, heavy machinery, line shafting bearings, motorized and lubricated valves.

Because weights of different values may be used and adjusted infinitely throughout the length of the lubricator arm, pressures may be applied to lubricants up to 150 psi.

Position of the lubricator arm gives an exact indication of the amount of lubricant in the cup, thus positive warning is given when the supply runs low. Grease cup, with capacity of 7½ oz., has a conical bottom to facilitate lubricant passage. Lubricant is supplied through a standard grease fitting located at the bottom of the grease cup.

These lubricators are furnished as standard equipment and are available immediately. Weight is 20 lb.—*Mixing Equip. Co., 1024 Garson Ave., Rochester 9, N. Y.*

DON'T MISS THESE . . .

Motor and fluid-drive coupling are integrated in a single frame.....Page 144

Sanitary pump uses one-piece rotor and shaft assembly, minimizes cleaning time...Page 144

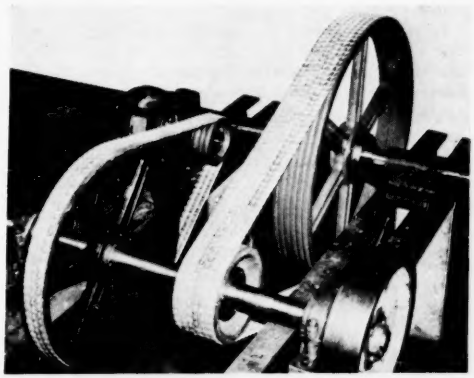
Flavor is distributed evenly in variegated ice-cream by a new mixer.....Page 146

Erosion immunity is high in dust-collector that uses new separation principle.....Page 149

AND WATCH FOR . . .

Semi-automatic sealer handles cases of various sizes without adjustment.....In November FI

Walk-in coolers are now built of prefab sections of metal-bonded plywood.....In November FI

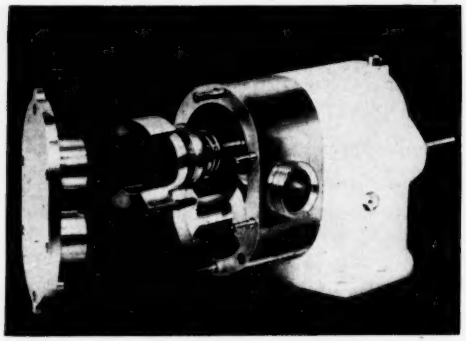


Drive Belts Provided In Adjustable Lengths

Inventories of endless belts can be minimized, it is reported, with the use of "Vee Ply" belting.

Specially designed to service emergency breakdowns, this belting can be adapted to most V-belt drive applications, thereby eliminating the need to carry a spare set of endless belts for every machine. Belting is easily uncoupled from roll stock as required, and it is adjustable to any length. There are no waste ends.

The belting is designed and recommended for continuous heavy duty service. It is not recommended, however, for severe shock loads or on drives that are under-belted.—*Worthington Pump & Machinery Corp., P. O. Box 953, Buffalo 5, N. Y.*



Sanitary Pump Cleaning Time Minimized

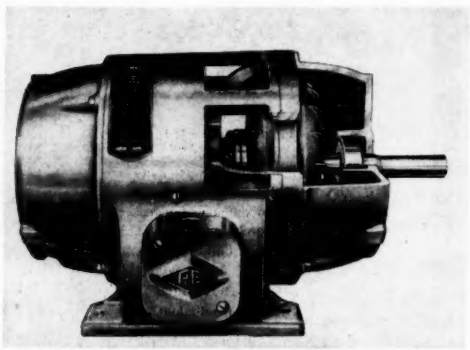
Several improvements have been included in the design of the company's sanitary pumps for handling milk, syrups, and food products.

The one-piece rotor and shaft assembly eliminates the internal shaft and the seal threads in the liquid end. Thus, sources of contamination of milk, food and other products are done away with. Wetted parts are quickly removable, reducing cleaning time to a minimum.

Controlled internal pump clearances assure positive product flow. Since there is no internal metal contact or friction between rotors and housing in the pumping chamber, flow settings remain constant.

Another feature is the slow pump speed, eliminating undue agitation or aeration of product being pumped. It is also stated by the manufacturer that use of a non-rotating seal and placing of seal springs outside of pumping chamber avoid "product-plug" and stop all messiness caused by leaks and drippage.

Pumps are available in capacities from 1 to 125 gpm., with pump speeds ranging from 50 to 600 rpm., and with port connections from 1 to 2½ in.—*Waterous Co., 80 E. Fillmore Ave., St. Paul, Minn.*



Motor, Fluid-Drive Coupling Framed in Unit

An unusual electric motor is announced for handling loads that require smooth acceleration for protection from jamming and shocks.

The new units, called Fluid-Shaft motors, feature a single frame, integral design of motor and fluid-drive coupling.

The design places emphasis on savings in original cost and also savings in space, since less mounting area is required than with conventional units. The company utilizes its regular electric motor frames and end bells, eliminating further need for special parts.

There is no need to overmotor because the motor is practically up to speed before any load is applied. This permits motor selection closer to actual horsepower requirements. Use of reduced starting current saves power. All starting and operating shocks are absorbed in a cushion of oil, assuring protection against jamming of equipment.

The new units are adapted to installations on conveyors, extractors, mixers, and other units. Motors are available in standard foot-mounted or round-body frames. All can be mounted either horizontally or vertically, or with NEMA flange and face type end bells. No special engineering is required for installation.

Prompt shipment can be made on ½ to 10 hp. units.—*Reuland Electric Co., Alhambra, Calif.*

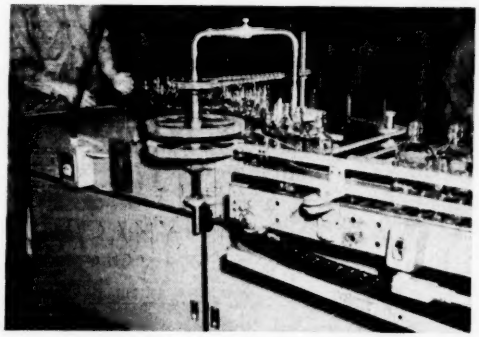


Table Unscrambles Varied Containers

Capable of handling practically every type and shape of container is a straightline unscrambling table recently introduced. A special flask discharge attachment keeps such odd shaped containers as flasks and jars moving to the discharge conveyor with clock-like precision.

There are three conveyor belts moving at different speeds keeping the containers moving in the direction of the discharge opening with rhythmic regularity. The discharge V-belt of Cyclone mesh and the Rex Table Steel No. 815 Chain can be readily interchanged to accommodate containers from vials to jugs.

Rate of discharge depends on the size of the item, running from 60 large jars to 240 small bottles per min.

Field tests reveal the unit operates trouble-free, with no breakage. Spilling of bottles is minimized, and there is no crowding. This eliminates the necessity to keep a vigilant look-out for jam-ups.

A tilting-table idea eases the job of turning over the carton on the table, and as it is moved forward, the table levels off and the containers come in contact with the moving conveyors. The table tilts back ready for the next carton. No container has to be touched, assuring high sanitation for containers to be filled with edibles.

Unscrambling tables are available in right- and left-hand discharge models. Unit is equipped with a ⅓ hp., 1,750 rpm. motor with V-belt drive to reducer with variable speed control wheel.

Length is 6 ft. and width 21 in. Height is adjustable to fit in virtually every production line.—*Island Equip. Corp., 27-01 Bridge Plaza N., Long Island City, N. Y.*

(Food Equipment Continued)

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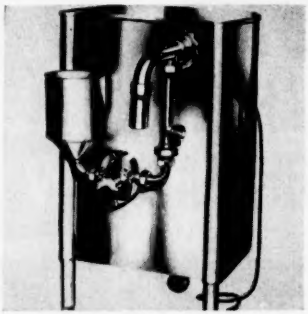


Flavor Distributed Evenly In Variegated Ice Cream

Precision veining for all flavors of variegated ice cream is stated possible with employment of the new Flavor Master mixer.

The metered flavor flow variegates the ice cream to the exact percentage desired. Eye appeal is thus greatly improved, and with the even distribution of flavor, taste quality is also improved.

Economy feature of the unit is that a lesser amount of flavor is required because of its uniform dispersion throughout the ice cream. Overrun is not affected.

The adjustment valve for metered flavor flow has fingertip control to assure the exact amount of flavor desired. There is no flavor leakage. A protective layer of plain ice cream is maintained around the outside to assure clean, neat packaging.

Unit is adjustable to all sizes of freezers up to 300 gph., and it will handle all kinds of fudges and purees. The sanitary pump used is rotary sealed, has positive displacement, is precision made, and is demountable for easy washing and sterilization. The whole assembly comes complete with stainless steel cabinet.—*Bump Pump Co., La Crosse, Wis.*

New Ultrasonic Generator Simplifies Study Methods

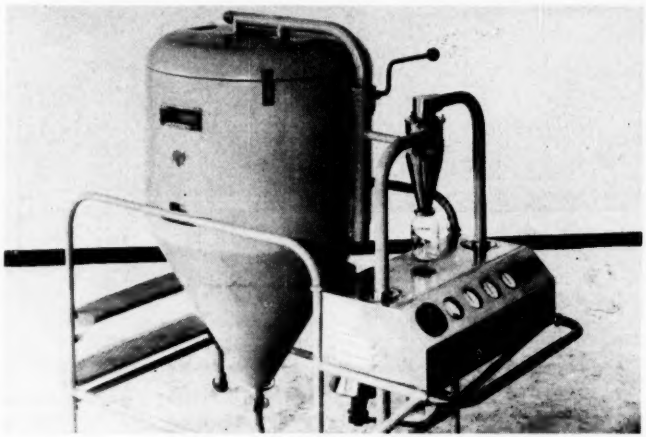
To provide a simple and practical method for studying the effect of ultrasonic energy on various materials and processes, a new ultrasonic generator has been announced.

The new device is for use in research laboratories.

Many applications in ultrasonic research are possible with the new instrument. Biologically, experimentation can be done on the destruction of some bacteria and the increase in virulence of others.

Physically, the transforming of immiscible liquids into stable emulsions, and the colloidal suspension of precipitates in liquids can be examined. Investigation into chemical reactions, such as oxidation, hydrolysis, and reduction, is possible.

Equipment consists of a power unit and a transducer assembly. Simple controls on front panel include On-Off switches for the high voltage circuit and the filament circuit, a voltage control to vary the power, and an instrument which indicates the power supplied to the quartz crystal.



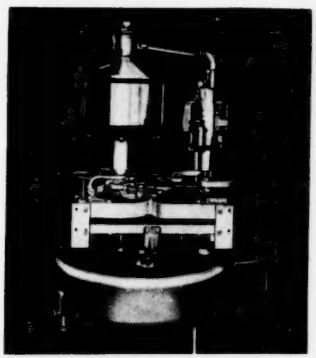
Lab Spray-Dryer Is Portable

For experimental work in laboratories, a new, compact, portable spray-dryer is stated to afford performance parallel to that of the larger commercial units. It is constructed of stainless steel.—*Niro Corp., 52 Broadway, New York City.*

Transducer assembly is mounted on top of the cabinet. It consists of a transparent cylinder to hold insulating oil around the high voltage leads coming from the electronic circuit to the crystal. The transducer, or crystal, forms the bottom of a test well which is immersed in the insulating oil. Material to be tested is placed in a beaker or test tube within this well and is directly exposed to vibrations from the crystal.

Unit is 45 in. high, 21 in. wide, and 19 in. deep. Test well is of 1¾-in. dia. and has a depth of 2⅝ in.

Power input is 500w. at 115v., 50 cycles, while power output is 200-250 acoustical watts.—*General Electric Co., Schenectady 5, N. Y.*



New 7-Valve Milk Filler Has Big-Unit Features

This new 7-valve filler, being introduced for medium-size dairies, has several mechanical and sanitary features previously available only in the large-capacity machines.

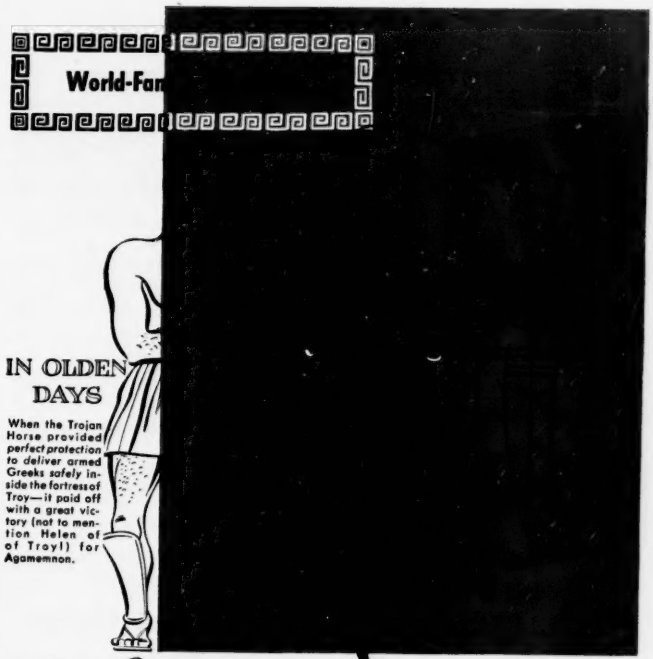
Known as the "Milwaukee 72" it has a variable speed range of 20 to 50 bottles per min. It is available either as a gravity or gravity-vacuum type machine (latter is seen here), and it is so designed that the gravity type may be changed over to gravity-vacuum filling in the field, if desired.

Both left-hand and right-hand machines are available. Either manual feed and pick-off or automatic conveyor operation can be furnished.

The gravity type filler, Model G-72, has the new patented stainless steel diaphragm type Uniform Filling valves. The vacuum unit Model GV-72, has stainless steel diaphragm type Gra-Vac filling valves similar to those used on the larger Model "K" filler.

The new filler has a stainless bowl and cover, and handles all standard sizes of glass bottles from ½ pt. to

(Food Equipment Continued)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When the Trojan Horse provided perfect protection to deliver armed Greeks safely inside the fortress of Troy—it paid off with a great victory (not to mention Helen of of Troy!) for Agamemnon.

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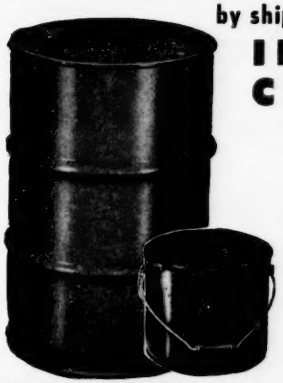

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THE open mesh of Cyclone Metal Conveyor Belts permits the free, unobstructed circulation of air, gas and heat around the product you are processing, as well as immediate and constant drainage of liquids.

In fact, Cyclone Metal Conveyor Belts are the perfect answer to the whole problem of "circulating" your product through its various processing operations. Flexible, porous, sanitary, and heat-resistant, Cyclone Belts are tailored to the job at hand. They're available in three basic styles . . . Flat Wire (shown), Chain Link and Flex-Grid . . . and in a wide selection of metals, alloys, widths and mesh sizes.

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Because assured customer satisfaction for your seasoned or flavored food product can be achieved easily with Spiceolate (water-solublized) flavors, Essential Oils or Oleo Resins.

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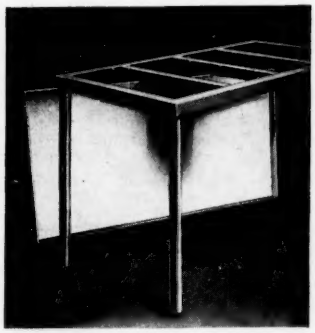
2 qt. including the new rectangular 2-qt. bottle. It will also handle conical paper containers that take disk caps. Disk or coverall type cappers can be furnished. — *Cherry-Burrell Corp., 427 W. Randolph St., Chicago 6.*



Sanitary Work Table Has Removable Top

Feature of this new sanitary work table is a removable stainless steel top, thus facilitating cleaning. It has supporting frame of painted steel, and galvanized steel ball-foot pipe legs. Tables are available in four sizes: 4 ft. x 30 in., 5 ft. x 30 in., 3 ft. 6 in. x 30 in., and 7 ft. x 30 in. All are 36 in. high.—*The Creamery Package Mfg. Co., 1243 W. Washington Blvd., Chicago 7.*

Rubber Vacuum Hand Hose Is Flexible, Extendible

Here is a rubber hose vacuum hand tool seen of particular value where complicated machines must be regularly cleaned.

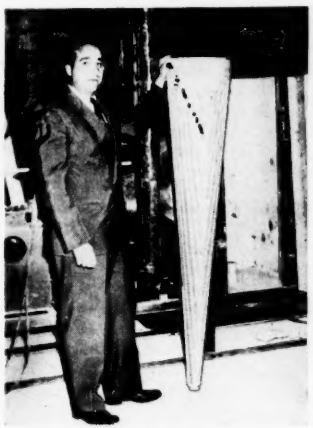
Its flexibility permits it to be stretched more than twice its length, and thus it may be bent in and around complex machine parts, without pinching or collapsing. It enables the operator to apply maximum suc-

tion with a massaging, loosening action, at hard-to-reach machine parts.

Designed originally to clean spiral conveyors and ratchet wheel assemblies of flour bucket elevators, it has many other applications.

The tool may be bought separately, or can be had with a 2-in.: 1½-in. reducer, or 1½-in. connector, in 36-in. lengths. Thickness of the convoluted side walls is less than $\frac{1}{16}$ in., while the smooth wall ends are ⅛ in. thick, 2 in. long, and have a 1½-in. inside dia.

While designed specifically for use with Doyle vacuum machines, it can be used with other makes as well.—*Lehara Sales Corp., 485 Fifth Ave., New York.*



Erosion Immunity Afforded In New Dust Collector

Designed to work efficiently even on large installations, a dust collector based on an entirely new principle of separation is announced.

The unit is particularly suitable for handling abrasive dusts or grits. Immunity to erosion is notable.

The filter surface consists of a specially slotted sheet bent into the form of a cone. Air or gas to be cleaned is passed at high velocity over this surface.

Because of the form of the slots, aerodynamic forces are set up, with the resultant force on the dust particles being in a direction away from the cone face. This force keeps the dust particles suspended in the form of a thin cloud layer immediately in front of the filter surface, while the clean air escapes through the slots.

These slots or passages for the clean air are many thousand times larger than the dust particles which are removed, so that even with adhesive dusts there is little tendency for the

(Food Equipment Continued)

PAPER that gets around

Ummm . . . Good! The fishing? Well, possibly—but we are referring particularly to the aroma of good tobacco—tobacco at its best because Rhinelander protective packaging papers have kept it moist, fresh, and fragrant . . . the right papers for an exacting job.

The succulent shrimp is a midget in size, but upon his savory flesh is based big business indeed. He's wet, fat, and perishable, and packaging him properly has proved certain Rhinelander G&G* Task Papers exactly right for the job.

Rhinelander is often invited to enjoy the hospitality of YOUR home. Yes, at this very moment it is more than likely that our G&G* Task Papers can be found protecting a score of fine food items on your kitchen and refrigerator shelves.

*Glassine and Greaseproof the functional papers that do so many tough jobs well.

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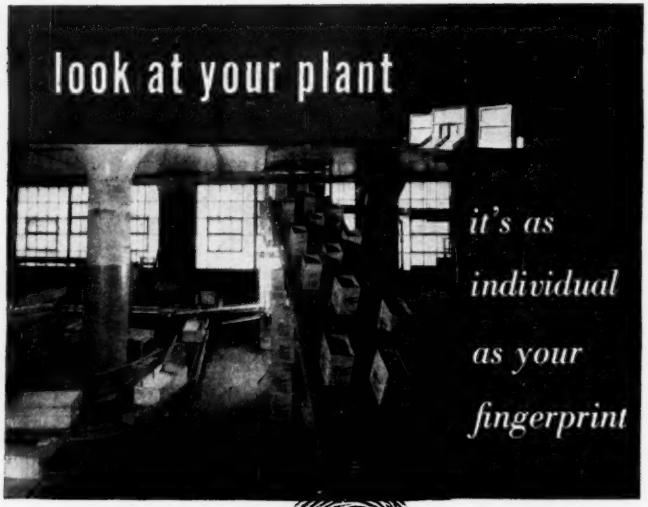
look at your plant



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filter to become clogged at any time.

The dust layer is carried at high speed to the outlet end of the cone, where it is continuously withdrawn, together with a very small percentage of the air or gas, into the secondary circuit. The concentrated dust mixture in the secondary circuit is then passed through a small collector for precipitation into a suitable container. Secondary air is returned to the inlet of the cone, where it again passes through the same process.—*Aerodyne Development Corp., 901 Leader Bldg., Cleveland 14.*

Equipment Briefs

Telescopic Conveyors of roller and skate-wheel type, have combined light weight with strength. Closed, they are 54 in., extended 10 ft. 4 in. They can carry 75 lb. per sq. ft., yet are light enough to be easily portable.—*Maguire Machinery Co., Inc., 1000 N. Division St., Peekskill, N. Y.*

Air Purifier called the "Food Saver" is small and compact for use in walk-in coolers. Called the "Food Saver", device uses activated carbon as a filter to remove gases or vapors (odors) from refrigerated air.—*W. B. Conner Engr. Corp., 114 E. 32nd. St., New York City.*

Electric Heat-Sealing Plates, newly marketed, feature thermostatic control for closing hand-wrapped packages.—*Edwin L. Weigand Co., 7500 Thomas Blvd., Pittsburgh 8, Pa.*

Wound-Rotor Motors built in NEMA frames 224-505, in ratings up to 100 hp. and larger now have drip-proof frames and shields. They are also available splash-proof and totally-enclosed non-ventilated. — *Crocker-Wheeler Electric Mfg. Co., Div. of Joshua Hendy Corp., Ampere, N. J.*

Kraft Paper Bags having a moisture-proof transparent film window have been developed. Bags may be used for pre-packaging of moist produce.—*Union Bag & Paper Corp., Woolworth Bldg., 233 Broadway, New York City 7.*

Dual-Duty Hand-Truck is obtained by folding down handle of newly designed flat truck. Unit is made of an aluminum alloy, has a total weight of 42 lb., and a capacity of 400 lb. Flat truck bed is 36 in. by 17 in.—*Mar-Wenz Mfg. Co., 83 Shipley St., San Francisco.* —End

Crucial Quality in Flavor Control

Yours with Griffith SOLUBILIZED *Seasonings*

● *Penetration* is the quality a seasoning has when it disperses easily and blends thoroughly with the product. When it's a Solubilized Seasoning, it's a skillfully blended Griffith formula *with* the crucial quality of penetration!

BLENDED TO A GOURMET'S TASTE

Solubilized Seasonings are blended by chemists who apply Griffith's unequalled laboratory and commercial experience. Converting ground spice formulae to Solubilized Seasonings is one of their arts. Yet, the quality of every Griffith formula must be proved in the research kitchen.

PROCESSED FOR PENETRATION

The spice extractives in a Griffith Solubilized Seasoning are homogenized—to *blend* them. That process reduces them to tiny globules which really penetrate and flavor your product uniformly.

Every seasoning formula—even yours—can be Solubilized for *complete* flavor control. Why not write us today!

Remember Griffith Purified Ground Spice, processed under U. S. Sterilization Patents No. 2107697, 2189947, and 2189949.

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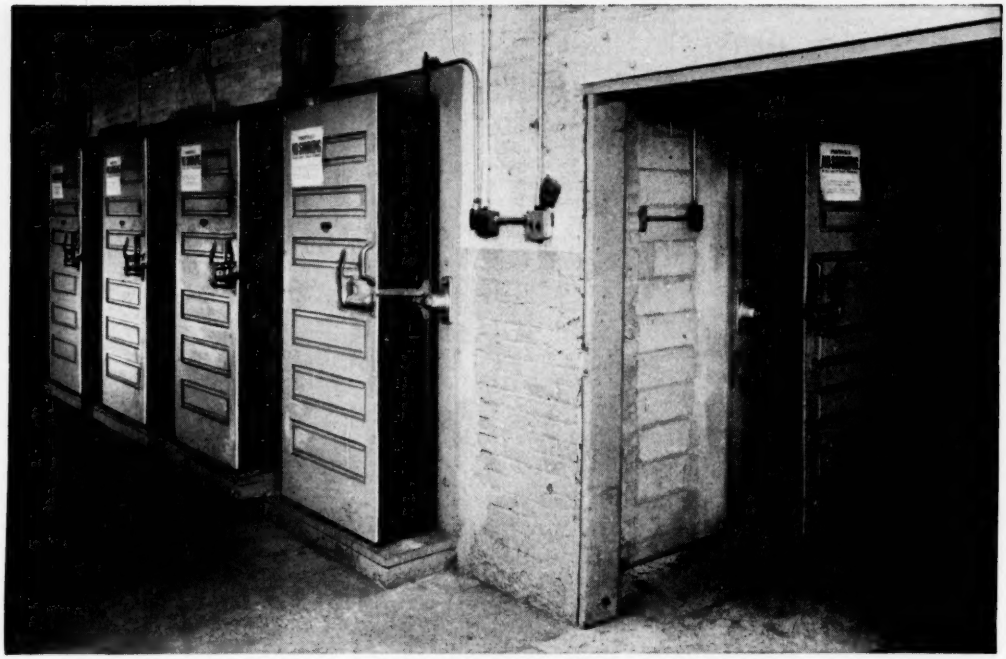

Cold Storage Doors in a Machine Shop

Cold treatment of aluminum castings was found to impart desirable machining qualities to the metal.

This called for a sub-zero refrigerated space from which quantities of castings could be moved in and out readily. Jamison-built overlap type doors were selected. Ten inches of corkboard insulation were specified for the doors to equal the insulation of the walls.

Jamison cold storage doors are available for every temperature range and every type opening to refrigerated space. Our engineers will be glad to help you solve your problems. For information on Jamison-built doors, ask for Catalog 175.

JAMISON COLD STORAGE DOOR CO.

Hagerstown, Maryland, U. S. A.

Oldest and Largest Manufacturer of Cold Storage Doors in the World

Catalogs, Bulletins

Food Plant Equipment

Enclosed Motors

Asbestos-protected windings, drip-proof housing, lubrication of bearings by flushing, and annealed laminations are among the features of ¼ to 250 hp. motors discussed in multi-color Bulletin 1524.—*U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles 54.*

Flour and Feed Equipment

Hammer, roller, attrition and pellet mills, mixers, pneumatic systems, cutters, crushers and feeders for the flour and feed industries, are illustrated and described in Bulletin 45-B.—*Sprout, Waldron & Co., Muncy, Pa.*

Vertical Tubular Heater

Simplified design of vertical tubular heater, for low initial and maintenance costs, features bare tubes and absence of metal parts exposed to furnace gases, reports 4-page Bulletin 0-49-7.—*Foster Wheeler Corp., 165 Broadway, New York City.*

Globe, Angle and Check Valves

New design and construction of 125-lb. S. P. bronze valves are detailed with specifications in colored Circular 582-4-49.—*The Lunkenheimer Co., Cincinnati 14.*

Chemical Feeding

New diaphragm pump, equipped with transparent plastic reagent head, feeds liquids and slurries into pipelines continuously, reports 8-page Bulletin SAN-7. Construction and installation details are illustrated.—*%Proportioneers, Inc.%, 9-93 Codding St., Providence, R. I.*

Automatic Check-Weigher

Production line control of weight is accomplished with automatic check-weigher described in Selectrol folder, which classifies articles into underweight, exact weight, and overweight with rejection point accuracy of ±1g. Bulletins 3208 and 3201 cover other scale models, including electrical Shadograph weighers.—*Exact Weight Scale Co., Columbus 12.*

Visual Lubrication

Gravity feed, wick feed, constant level, vibrating rod and multiple oilers with visible oil supply and unbreakable reservoirs are covered in 8-page booklet.—*Gits Bros. Mfg. Co., 1846 S. Kilbourn Ave., Chicago 23.*

Packaging Aparatus

Metal-end fiber cans for frozen foods can be overwrapped neatly before or after freezing by adaptation of standard packaging machine described in Folder 103-7-49. Also covered is bundler for small packages.—*Package Machinery Co., Springfield 7, Mass.*

Rendering and Blood Drying Cookers

High pressure or vacuum rendering and blood drying for food and non-food use are functions of Boss cookers covered in Bulletin 1. Catalog 627 details sausage machinery and accessories in 38 pages.—*Cincinnati Butchers' Supply Co., Cincinnati 16.*

Pumps for Food Industries

Quarterly house organ, *Viking Vacuum*, contains articles and illustrations of interest to prospective or present users of pumps. The 1949 summer number presents new sanitary pump, new line of jacketed pumps, and seed and vegetable dryer installation.—*Viking Pump Co., Cedar Falls, Iowa.*

Steam and Condensate Return Systems

Fuel savings are secured by returning steam and condensate to the boiler at practically the same temperature as steam already in the boiler, says 4-page folder. Equipment, delineated in Returnal brochure, eliminates traps.—*Planert Mfg. Corp., 2256 W. Walnut St., Chicago 12.*

Feeding Vitamin Concentrates

Dry bleach, malt and bromate, and vitamin concentrates can be fed into flour continuously and automatically by means of adjustable-speed grooved disc apparatus described and illustrated in 4-page Bulletin 55-F1.—*Omega Machine Co., Providence 1, R. I.*

Stepless Speed Control

Multiple speed performance from machines that normally have a single speed or a few speeds can be obtained with Vari-Pitch speed changers discussed in 12-page booklet.—*Allis-Chalmers, 715 N. Van Buren St., Milwaukee 2.*

Heat Sealers

Variety of heat sealing equipment ranging from portable heat-sealing iron and portable flush-type hot-plate to hand and foot-operated bench types is illustrated with specifications on information sheets.—*Cleveland Lathe & Machine Co., 676 Broadway, Cleveland 15.*

Oil Mills and Nut Processing

Apparatus for cleaning, hulling and sizing oil seeds and for roasting, blanching and grinding nuts and preparing nut butters is classified and pictured in Catalog No. 50.—*Bauer Bros. Co., Springfield, Ohio.*

Heat Exchangers

Standard heat exchanger construction details, as well as general manufacturing facilities and information on plate fabrication are covered in 16-page book.—*Downington Iron Works, Downington, Pa.*

Variable Speed A.C. Drive

Machines in the variable speed category, requiring constant torque input, can be driven by Ajusto-Spede a.c. motors described and illustrated in 12-page Bulletin 611-D.—*The Louis Allis Co., 427 E. Stewart St., Milwaukee 7.*

Vertical Batch Mixer

Bakery products can be mixed with greater efficiency and improved texture in Glen "340" Dual Ratio vertical batch mixer, reports information circular. Dual ratio principle refers to relationship between speed of head and speed of beater, which sheet says should be different for whipping and for mixing.—*American Machine & Foundry Co., 485 Fifth Ave., New York City 17.*

Materials Handling

Portable Conveyor

Ideas for use of lightweight, portable, adjustable, power conveyors for handling bulk or packaged goods, or both, are presented in illustrations and text of Catalog 495.—*Lake Shore Engineering Co., Conveyor Div., Iron Mountain, Mich.*

New Ideas for Pallet Handling

"Pallet Handling Down on the Farm" is title of article in spring edition of house organ, *Exide Topics*. It details unusual use of pallets and battery-powered forklift trucks for onion storage. Other articles in this publication cover unit-loading methods and time study. There is also material on storage batteries.—*The Electric Storage Battery Co., Allegheny Ave. at 19 St., Philadelphia.*

Steel Strapping

Improvement in packaging and car bracing with steel strapping is subject of 8-page foldout covering proper application of steel strapping, package reinforcement, unit-load methods, and equipment for using strapping.—*Acme Steel Co., 2840 Archer Ave., Chicago 8.*

Supplementary Units

Such smaller equipment units as hand lift trucks, barrel trucks, pick-up pallets, rectangular and triangular dollies, skids, carboy pourers and rockeracks (for draining barrels and drums) are covered in Bulletin 4881.—*Barrett-Cravens Co., 4609 Western Blvd., Chicago 9.*

Skid Transporter

Vertical hydraulic lift on motorized hand truck makes it possible to handle skid platforms of virtually all heights, reports 4-page folder. Dimensional and other specifications are covered.—*Automatic Transportation Co., 101 W. 87 St., Chicago 20.*

Pyrex Pipe

Use of glass pipe in the transfer of vinegar, fruit and vegetables, baby foods, brines, wines, and dairy products during processing is treated in 16-page illustrated Booklet EA-1.—*Technical Products Div., Corning Glass Works, Corning, N. Y.*

Materials Handling Movie

Announcement of availability, on loan basis, of motion picture showing materials handling in variety of plants is made in Vol. 7, No. 2, of house organ, *Material Handling News*, which also carries photos and data on fork trucks.—*Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.*

Roller Chain

Data on operating characteristics and new features of line of roller chains are included in 12-page catalog. Photomicrographs, engineering drawings, component photos and specifications are included.—*Atlas Chain & Mfg. Co., Caster & Kensington Aves., Philadelphia 24.*

Control Equipment

Flow Meters for Steam or Air

Advantages of two different models of by-pass flow meters for steam, air and gas described in Bulletins 400-F-1 and 400-F-2 are high accuracy over wide range, open upper limit, easy installation, low maintenance and direct-reading totalizer. — *Builders-Providence, Inc., Providence 1, R. I.*

Liquid Meters

Positive-displacement meters for handling liquids are reported in 2-page bulletin. They provide data on daily or hourly consumption, interdepartmental demand and other inventory control information, in addition to delivering pre-set quantities of liquids to batches.—*Neptune Meter Co., 50 W. 50 St., New York City 20.*

Cabinet-Type Instrument Panels

Minimum overall space of 24" x 72" x 12" accommodates variety of instrument units in one panel, reports Bulletin P1-1. Photos of available instrument units, specifications and

(Catalogs, Bulletins Continued)

Depend on

AUTO-LITE

FOR TEMPERATURE INDICATION

Auto-Lite Thermometers are designed to give you the broadest selection for your needs: Priced low and precision-made for accuracy, these instruments point the way to uniformity in processing and help to prevent waste. Write for catalog showing the many styles and types of Auto-Lite Thermometers that are available.

TYPICAL APPLICATIONS: PROCESSING & CHILL ROOMS, FREEZER, STORAGE & CURING ROOMS

Illustrated, at top: Model G Indicating Thermometer, flush mounting type with capillary tubing for remote reading. Priced from $18. At bottom: Model V Thermometer (vapor pressure type). Rigid stem for direct mounting. Priced from $10.25.

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INSTRUMENT AND GAUGE DIVISION, DEPT. FI-10

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prices are included.—*Wheelco Instruments Co., Harrison & Peoria Sts., Chicago 7.*

Food Processing Instrumentation

Series of data sheets for specific operations covers necessary instrumentation in text and diagrams. No. 3.2-7 applies to automatic control of deep fat fryer. Automatic, inexpensive control of hot water supply is featured in No. 11-3-3. Non-indicating controllers and their applications are treated in No. 83-3-33M, and recording controllers for fruit and vegetable blanching in No. 3.2-5. Electronic measurement of milk receipt temperatures and automatic control of batch pasteurizers may be found in No. 3.4-3 and No. 3.4-2, respectively. — *Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne & Roberts Aves., Philadelphia 44.*

Plant and Laboratory Indicators

Temperature, humidity, and specific gravity instruments of variety of types are illustrated and described in 40-page Catalog 15.—*H. B. Instrument Co., 2633 Trenton Ave., Philadelphia 25.*

Plant Supplies

Analytical Reagents

Specifications and prices on fine chemicals produced by Mallinckrodt are listed in 170-page pocket-size catalog.—*Harshaw Scientific Division of Harshaw Chemical Co., 609 S. Grand, Los Angeles.*

Synthetic Vanilla Flavor

Lignin vanillin of uniform quality is described with possible uses in 4-page folder.—*Vanillin Div., General Drug Co., 170 Varick St., New York City 13.*

Various Chemicals

Organic and inorganic chemicals produced by chlorination, hydrogenation, sulfhydration, hydrochlorination and fluorination are covered with physical data, descriptions and uses in Bulletin 100.—*Hooker Electrochemical Co., Niagara Falls, N. Y.*

Conveyor Chain Lubricant

Specialized lubricant, Oakite Composition No. 6, keeps conveyor chain surfaces lubricated, clean and bright, reports 8-page booklet. Methods of applying material, and action photos are shown.—*Oakite Products, Inc., 22 Thames St., New York City 6.*

Small Plugs and Cord Connectors

Illustrations, dimensional drawings and text of Catalog E-49-145 cover plugs and cord connectors for electrical equipment.—*Russell & Stoll Co., Inc., 125 Barclay St., New York City 7.*

Pressure Sensitive Tapes

Printed tapes, backed with pressure-sensitive adhesives, are offered in various materials for many purposes in 4-page folder. Specifications and recommended uses are listed.—*Topflight Tape Co., York, Pa.*

Silicates

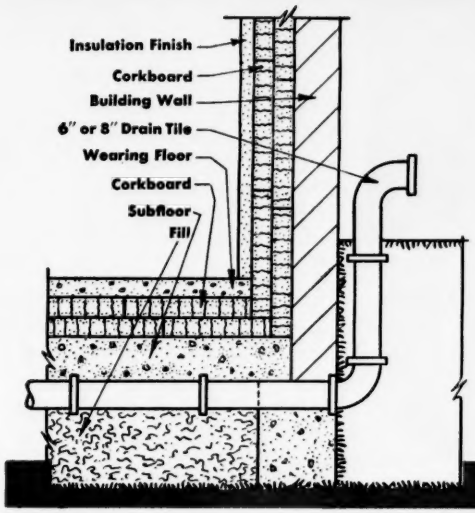
Silica compounds, and differences among them, are discussed in house organ, *Silicate P's and Q's*, Vol. 29, No. 7. Of particular interest is compound B-W for keeping boilers free from scale.—*Philadelphia Quartz Co., Public Ledger Bldg., Independence Square, Philadelphia 6.*

Aromatics

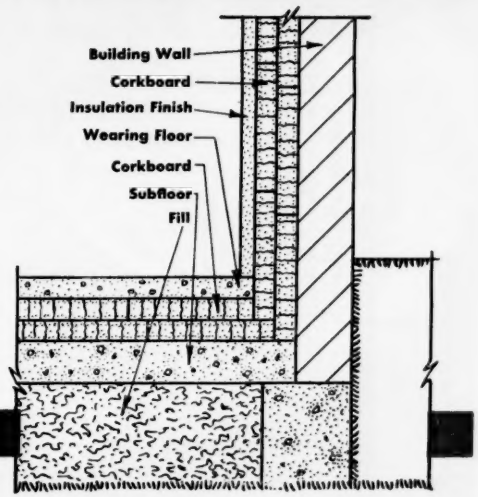
Essential oils, aromatics and flavoring materials for use in food and other industries are

(Catalogs, Bulletins Continued)

FOR ROOMS MORE THAN 20′ SQUARE



FOR ROOMS LESS THAN 20′ SQUARE



How to build a freezer room floor

Most freezer rooms more than 20 feet square and built directly on or below grade will eventually freeze the ground beneath them—even though floors are well insulated. This freezing of the ground causes gradual formation of a frost dome that will grow under the subfloor until it finally cracks and buckles the freezer room floor above. To prevent such destruction, Armstrong engineers and laboratory scientists have developed a simple set of construction specifications.

Air ducts, either of concrete or drain tile, are spaced at regular intervals in a cinder or crushed stone fill under the subfloor. These ducts, laid across the short dimension of the floor, allow for maximum circulation of warm air to dissipate frost and keep ground temperatures above the freezing point.

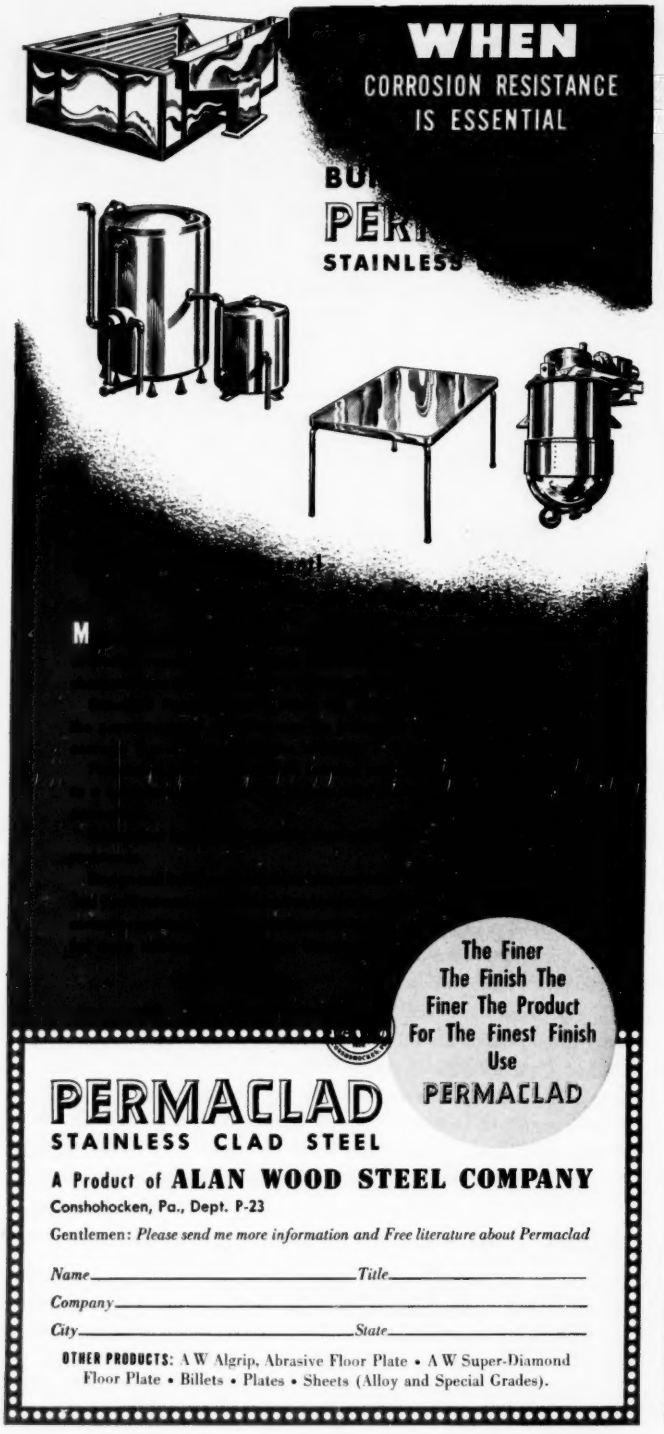
Ducts are not necessary for smaller size freezer rooms because enough heat from the outside will work its way in under the subfloor to prevent frost formation. However, these subfloors should be laid on a fill of about 16 inches of cinders or crushed stone so that adequate drainage is provided.

These specifications, solving a common problem in a practical and low-cost manner, are examples of the kind of thinking that prevails among the men who plan and erect Armstrong's insulation jobs. When you have an insulation problem, consult Armstrong's Insulation Contract Service. You'll get the advantage of Armstrong's long experience and time-tested engineering practices. For full information write today to Armstrong Cork Company, Building Materials Division, 4210 Concord Street, Lancaster, Pa.

ARMSTRONG'S INDUSTRIAL INSULATIONS

MATERIALS INSTALLATION

FOR ALL TEMPERATURES FROM 300° F. BELOW ZERO TO 2800° F.



Catalogs, Bulletins

listed with suggestions and prices in Third Quarter, 1949 Catalog.—*Magnus, Mabee & Reynard, Inc., 16 Desbrosses St., New York City 13.*

Display Units

Three-dimensional display units in natural color for merchandising ice cream and frozen foods can be used in wall or shadow box installations, or to fit superstructures of merchandising cabinets, reports 24-page catalog.—*Pond Displays, Inc., Ardmore, Pa.*

Emulsifiers, Stabilizers, Thickeners

Products for baking, brewing, candy, cheese, chewing gum, chocolate milk, ice cream, marshmallow, meringue, oleomargarine, peanut butter, salad dressing, sausage, soups and yeast are listed, with suggested formulas for their use, in 8-page folder.—*Glyco Products Co., Inc., 26 Court St., Brooklyn 2, N. Y.*

Soybean Products

Uses of edible soy oil in shortenings, margarines, and salad dressings, and uses of the flour and its products in the bakery, meat, and confectionery industries are discussed in multicolor book, *Cracking the Soybean.*—*Archer-Daniels-Midland Co., 600 Roanoke Bldg., Minneapolis 2.*

Boxes for Air Shipment

"How to Ship by Air in Corrugated Boxes," 9th edition of Publication 6 in Little Packaging Library, details proper, economical use of air express, air freight and air parcel post, and gives case histories on air shipping of fresh sea foods, live baby chicks, and other items.—*Hinde & Dauch Paper Co., Sandusky, Ohio.*

Adhesives and Facilities

New booklet covers line of adhesive products and facilities, classified into ten main divisions and discussions of raw materials and end use in industries. Booklet is especially for new users of adhesives.—*Paisley Products, Inc., 1770 Canalport Ave., Chicago 16.*

Miscellaneous

Metal Products Fabrication

One company's experience, knowledge and facilities in field of metal fabrication of processing, materials handling and storage equipment are outlined in 24-page Bulletin 490.—*L. O. Koven & Brother, 154 Ogden Ave., Jersey City, N. J.*

Can Washers

Different models of can washers, weigh tanks, and conveyors for cases and cans for the dairy industry are illustrated and described in detail in bound issue of Bulletins 740, 803, 814, 793, 749, 815, 817 and miscellaneous material.—*Rice & Adams Corp., 1150 Military Rd., Buffalo 17, N. Y.*

Anti-Bacterial Cement

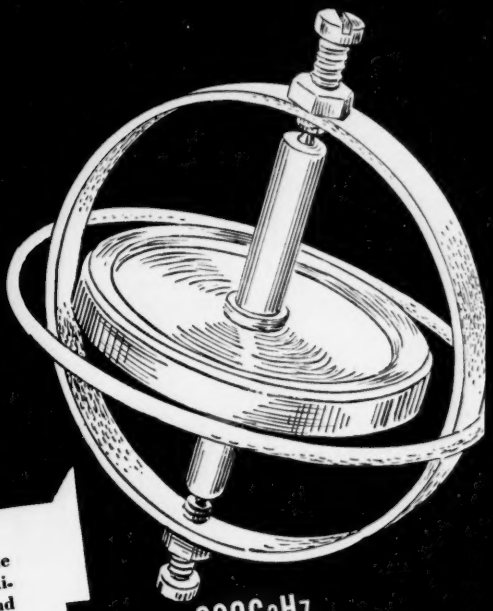
Fewer fungi, fewer bacteria and longer-lasting floors are reported advantages of anti-bacterial cement described in 8-page folder. Material is mixed and used like Portland cement. —*North American Cement Corp., 41 E. 42 St., New York City 17.*

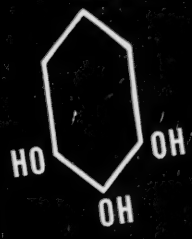
Truck Refrigeration

Complete unit for truck refrigeration to 45-50 deg. F. is illustrated and detailed in question-and-answer style in 4-page folder. Folder also announces availability of Catalog D49 of entire line of refrigeration products.—*Kold-Hold Mfg. Co., Lansing 4, Mich.*

—*End*

PROPYL GALLATE





Heyden Propyl Gallate is a purified form of n-propyl gallate (propyl 3,4,5-trihydroxybenzoate). It is a powerful antioxidant serving effectively as a stabilizer for edible oils and fats, ethers, emulsions, waxes and other materials subject to deterioration or auto-oxidation through formation of peroxides. It is active in very low concentrations and protects color, odor and taste of the finished product. It is non-toxic in the amounts commonly used.

PROPERTIES

Appearance	Ivory, fine powder
Odor	Odorless
Taste	Tasteless in 0.01% solution
Melting Point	147°—149°C.
Solubility (g. per 100 g. solvent)	
Water at 25°C.	0.35
Water at 50°C.	1.8
Ethanol at 25°C.	103
Ether at 25°C.	83
Glycerol at 25°C.	25
Propylene Glycol at 25°C.	67
Cottonseed Oil at 30°C.	1.23
Lard at 45°C.	1.14

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Shipped in 200, 100, 50 and 25 lb. fiber drums. Detailed technical data sheet will be mailed promptly upon request on company letterhead.

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One of a Series Dedicated to the Nutritional Advances of the Food Industries

KEEPING FAITH WITH NATURE

NATURE ENDOWED APPLES with important health values. Although ascorbic acid (Vitamin C) is among these, the content is not high or uniform because of variations in species, soil, and climate. When processed into juice, the ascorbic acid naturally present is largely destroyed with resulting losses in flavor and quality. Yet consumers rely on fruit juices for Vitamin C, and justly expect integrity of flavor and color.

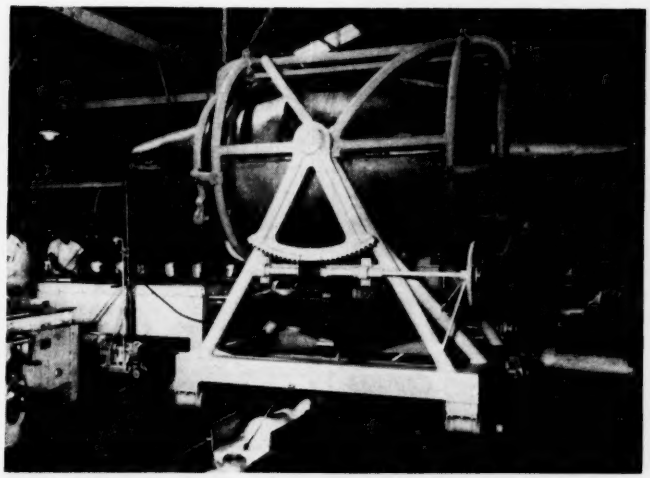
Enrichment with ascorbic acid provides an easy solution to these twin problems, permitting a label claim of standardized Vitamin C value, while helping to achieve new high standards of *color* and *flavor*.

You Keep Faith with Nature doubly when you enrich your apple juice with Vitamin C.

'ROCHE'
ASCORBIC ACID *for*
retaining Nature's goodness

VITAMIN DIVISION • HOFFMANN-LA ROCHE INC. • NUTLEY 10, NEW JERSEY

New Technology



Trommel Increases Capacity of Cheese Factory

Augmented production of Cheddar cheese without the installation of additional vats, has been achieved in some Australian factories by the use of a portable trommel to separate whey from curd. The drained curd from two vats may then be placed in one vat for final processing, and the second vat refilled with milk.

The trommel (see photo) consists of a 16-gage stainless steel drum 15 ft. long and 5 ft. in dia., with ends tapering to an 18-in. dia. opening. Center 6 ft. of the drum is perforated with 3/32-in. holes, spaced six to the inch, for whey drainage. Four $\frac{5}{8}$-in. stainless steel rods are mounted inside the drum. They are equally spaced and 1 in. from its surface. These impart a rolling movement to the curd when the drum is revolved.

The drum is set in a framework of 3-in. pipe, which is welded to a box frame 8 ft. square mounted on four 12-in. flanged wheels that run on rails set in the concrete floor. The drum is mounted on four cast iron rollers. It is rotated at about 6 rpm. by a 5-hp. electric motor through V-belt and reduction gears. Drum and top section of frame may be tilted to discharge curd while drum is in motion. Trommel is moved from vat to vat by a 1-hp. motor, which drives two of the flanged wheels.

Two curved, stainless steel sheets direct the whey from the drum into a large funnel mounted in the lower frame. The 3-in. outlet from this funnel feeds directly into a half-round whey chute that extends the length of the room and discharges into a stainless steel sump.

Cheese is transferred from vats to trommel by means of a portable centrifugal pump. The complete operation—from coupling up the pump to returning curd to vat—is performed in 17 min.

Digest from "The Design and Operation of the Cheese Trommel—Its Use in Cheddar Cheese Making," by J. M. Sharkey, Kraft Walker Cheese Co. Pty. Ltd., Melbourne, *The Australian Journal of Dairy Technology*, 3-6, Jan.-Mar., 1949.

CANNING

Brine From Blancher Water Improves Canned Peas

Retention of vitamins and minerals normally lost in the blanching of peas and other vegetables, and improved flavor of the canned products, are aims of a recently patented process.

In the process, blancher water, usually discarded, is utilized in making brine, which is then added to the vegetables in the cans. Prior to its use, the water is filtered to remove turbidity, suspended sediment, and bacteria.

Recommended method is pressure filtration—either single or 2-stage—using diatomaceous earth. Filtered water is pumped to a storage tank, from which it is withdrawn as required and mixed with sugar, salt and fresh water to form a canning brine (flow from blanchers is insufficient to satisfy all brine requirements). In addition to the vitamins and minerals saved, it is claimed that the blancher water contains sufficient sugar to reduce by 25 percent the amount required in the brine, and that the water has a distinctly pleasing flavor that improves the flavor of the canned vegetables.

Digest from U. S. Patent 2,471,170, issued May 24, 1949, on an application dated Feb. 15, 1949, to G. C. Scott and R. E. Oltman (deceased), Le Sueur, Minn.

Sterilizing Canned Food

Studies have been made on the thermal sterilization of canned foods, with special reference to evaluating the effect of: (1) Temperature distribution within the container at the start of the process, and (2) Retort come-up time. Simulating commercial canning conditions, heat penetration tests for conduction-heating were made on a 5 percent suspension of 300-mesh bentonite in water, and for convection-heating on a 2 percent suspension.

Results indicate that the process used should be based on an "initial temperature" which is the average temperature of the can contents at the start of the process, rather than the can center temperature, to compensate

(New Technology Continued)

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These durable, precision-built Casters assure the easy handling of heavy loads. Savings in floor and equipment wear soon pay for their cost. Ask your supplies dealer about Darnell products.

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DARNELL

CASTERS & E-Z ROLL WHEELS

for the effect of cooling of cans between closing and processing. The effective heating value of the retort come-up period in value of process time should be accepted as 42 percent of the come-up time as found by Ball in 1928.

Digest from "Thermal Processing of Canned Foods in Tin Containers. V. Effect of Retorting Procedures on Sterilization Values in Canned Foods," by D. V. Alstrand and H. A. Benjamin, *Food Research*, Vol. 14, 253-60, May-June 1949.

FERMENTATION

Origin of Chill-Haze in Beers

Cold-sensitivity, or chill-haze, of beer may have its origin at numerous points in the brewing process, beginning with malting of barley. It may be a varietal characteristic, and certain barleys of Sweden and Germany seem to be subject to it.

Thin-husked, or huskless, barleys should be used if possible. Low protein barleys do not appear to prevent chill-haze formation. Over-modification of the malt should be avoided, and careful attention should be given to drying the malt. It should be nearly dry before the final kilning—at about 176 F.

Mashing temperatures should be carefully controlled (140-145 F.) to prevent overheating during the saccharification interval. Beers from overheated mashes are generally chill-sensitive. Spargings carry haze substances into the wort and should be well boiled with the hops.

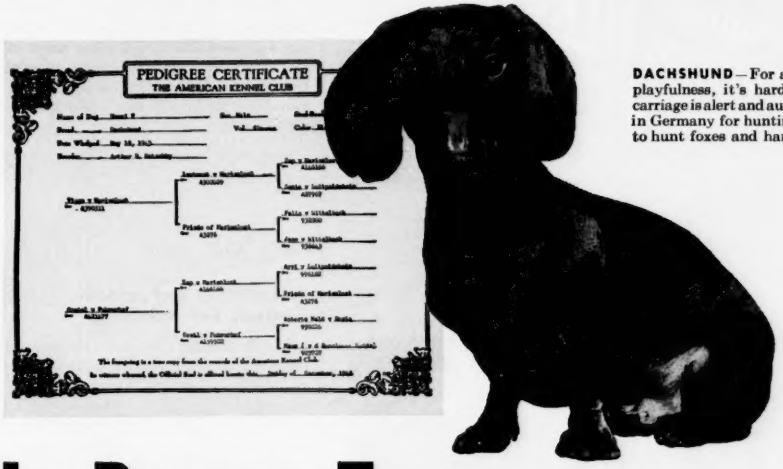
A high proportion of coagulable nitrogen in the wort or fermenting beer (either from insufficient boiling with hops, or from later yeast autolysis) can result in beer that clouds on chilling. Rapid chilling of beer from maximum fermentation temperature to racking cellar temperature coupled with quick cooling of wort prior to fermentation, is a good practice.

Filtering and handling beer in the cellars can also affect cold stability. Filtration of the colloidal chill-haze substances is more efficient with new filter mass, which has a greater absorptive capacity and surface activity than old, used material. Tanks receiving beer should be filled from the bottom to avoid splashing and foaming, both of which encourage oxidation and increase cold-sensitivity. Carbonation and pasteurization can both make beer more sensitive to cold. The pasteurization especially should be done with great care so that the temperature does not exceed 140 F.

In general, the chill-haze problem is less important in Germany than it

(New Technology Continued)

A Pedigree is a Promise of Quality



DACHSHUND—For affection, responsiveness and playfulness, it's hard to beat a dachshund. His carriage is alert and audacious. Originally developed in Germany for hunting badger, he can be trained to hunt foxes and hare, and track wounded deer.

In Boxes, Too.....

MAKERS of famous national brand products look for consistent quality, consistent service and fair price from their box suppliers. That's why Colgate-Palmolive-Peet ship Vel, the household detergent used by countless housewives, in Union Corrugated Containers...the boxes with a pedigree.

75 years of leadership in flexible packaging goes into Union boxes. Every step in the making, from timber to finished box, is quality-controlled by one management in America's largest pulp-to-container plant.

Tremendous forest resources, four modern box plants and five of the nine largest paper machines in the world make Union a dependable container source for any large volume shipper.

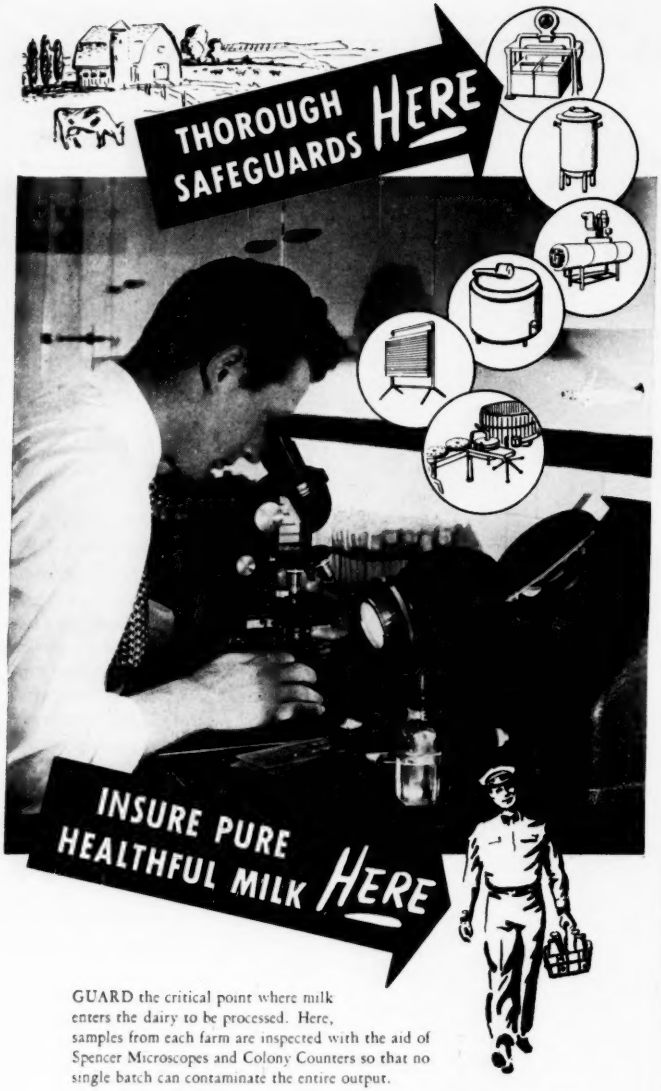
That's why, every month, more makers of famous brand products ship in Union boxes.

UNION Corrugated Containers

UNION BAG & Paper Corporation

Principal Offices: WOOLWORTH BLDG., NEW YORK 7, N. Y.

***Corrugated Container Plants:* SAVANNAH, GEORGIA • CHICAGO, ILLINOIS • TRENTON, NEW JERSEY**



GUARD the critical point where milk enters the dairy to be processed. Here, samples from each farm are inspected with the aid of Spencer Microscopes and Colony Counters so that no single batch can contaminate the entire output.

Be sure your laboratory has modern, efficient equipment to match the high standards set elsewhere in your dairy. New Spencer Microscopes offer many advantages to help your technicians do a thorough job—improved optical performance, convenient adjustments, newly-designed attached light sources if desired. The new Spencer Darkfield Colony Counter has improved illumination that increases counting accuracy and reduces operating fatigue.

For complete information about Spencer Optical Instruments, write Dept. V49.

American Optical Company
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Makers of Microscopes for over 100 Years

SPENCER

is in the U. S., where worts have less reducing power because of different mashing methods. Under German conditions of brewing, careful mashing and fermentation remove most of the chill-haze substances, and careful filtration and filling practices can remove the remainder and yield a cold-stable beer.

Digest from "The Chill-Haze Problem in Practice," by Karl F. Kretschmer, *Die Brauerei, Wissenschaftliche Beilage*, Vol. 2, 41-7, June 1949.

FATS AND OILS

Citrus Fiber Antioxidant Controls Fat Rancidity

Stabilization of animal fats against rancidity with an antioxidant extracted from citrus fibers is the purpose of a recent patent. In the process, 0.1-1.0 percent of dried or raw comminuted citrus peel, pulp or white tissue is added to the fat, and the mixture is heated to 100-200 C. for a period sufficient to enable the fat to extract the antioxidant from the citrus fiber. The spent fiber is then separated from the treated fat. When the fiber is added to the fat prior to treatments such as bleaching, deodorizing and rendering, the spent fiber is conveniently removed in the usual filtering operation.

Digest from U. S. Patent 2,461,080, issued Feb. 8, 1949, on an application dated June 9, 1945, to M. M. Piskur and J. W. Higgins, assigned to Swift & Co.

Adsorption Bleaching of Oils

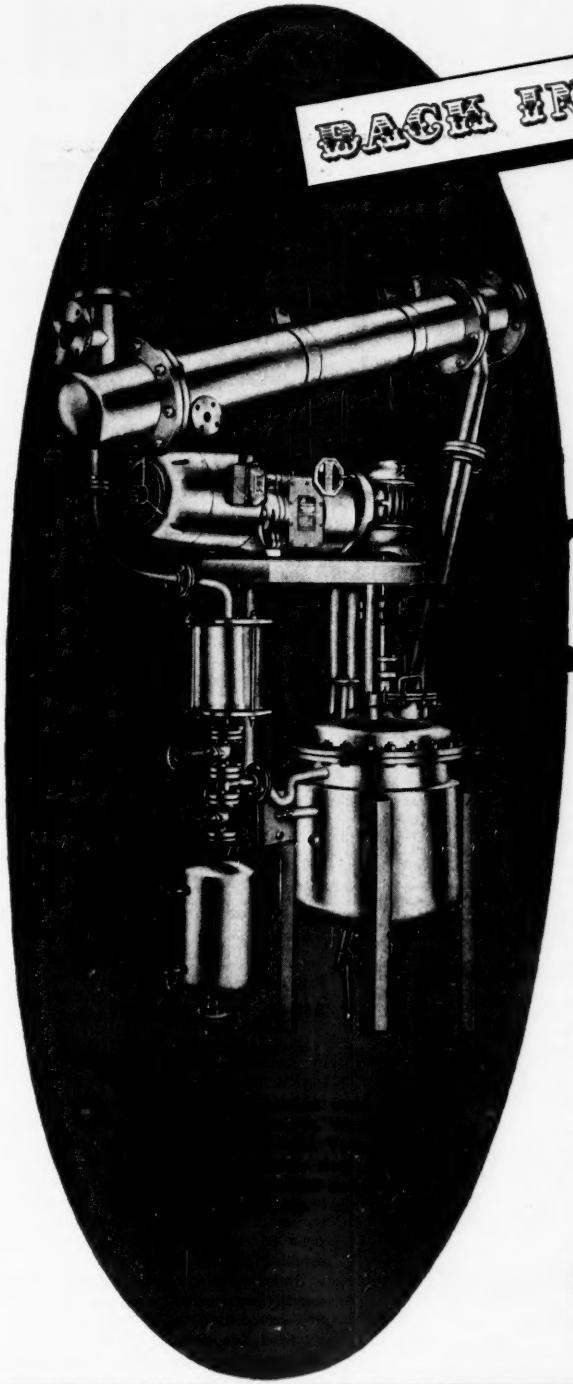
Vacuum bleaching or bleaching in an inert atmosphere, results in fatty oils of significantly lighter color. Multiple stage bleaching under atmospheric conditions shows no advantage because of the adverse oxidative effects.

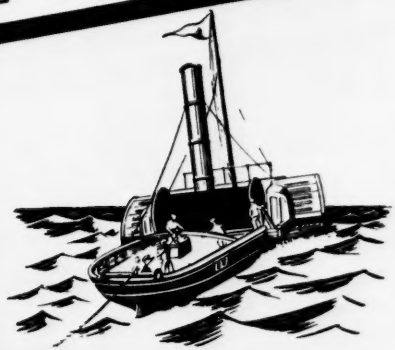
In bleaching fatty oils, an equilibrium exists between two favorable and two unfavorable color reactions. Adsorption of color and oxidative decrease in color are favorable. Oxidative increase in color and oxidative stabilization against adsorption are unfavorable. Experiments were conducted to show the effect of oxidation on bleaching results, and to compare atmospheric with vacuum bleaching using laboratory methods.

Samples of refined cottonseed oil were bleached with 1 percent activated clay when exposed to air: (1) Under normal atmospheric conditions; (2) at 1 mm. Hg pressure; (3) at pressure below 10 mm. Hg, with water vapor constantly bubbling through the slurry; and (4) where the mixture was evacu-

(New Technology Continued)

BACK IN THE 1880's





WHEN THE FIRST TRANSATLANTIC CABLE WAS LAID

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WAS MAKING INDIVIDUALIZED FOOD EQUIPMENT

Because the food industries have always adopted the most economical, efficient production methods, more people have enjoyed better food at a lower cost. For over 68 years, KOVEN has been supplying many of the country's foremost food plants with precision engineered and built equipment that eliminates waste time and motion on the production line, effecting all-around savings. The facilities of our two vast plants are at your service: machine, welding, painting and galvanizing shops, plus X-ray inspection to insure quality control.

Among the many KOVEN products in all commercial and non-corrosive metals: Stainless Steel; Aluminum Sheet Fabrication; Boxes, Tote, Waste Cans; Chemical Apparatus; Coils and Pipe Bands; Copper Sheet Fabrication; Galvanizing Work; Mixers, All Kinds; Monel Metal Fabricators; Pails, Special Heavy; Pans, All Types, All Metals; Sinks, Scullery and Factory; Tables, Galvanized or Monel; Tanks, All Types, All Metals; Kettles, All Types, All Metals.

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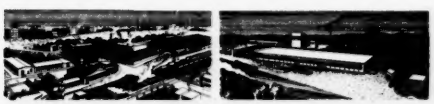
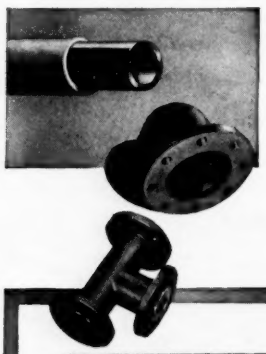
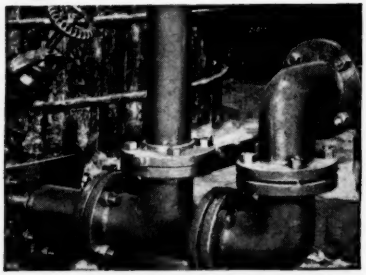


PLANTS: Jersey City, N. J. • Dover, N. J.

KOVEN FOR INDIVIDUALIZED FOOD EQUIPMENT SINCE 1881

saran lined steel pipe





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- reduces shut-downs and lost production!
- saves time and labor!
- readily field-fabricated!

The conveyance of corrosive liquids can prove as hard on profits as it is on equipment. Saran Lined Steel Pipe is designed and constructed to protect YOUR profits. It combines the desirable features of steel pipe—rigidity and pressure strength—with Saran's unusual resistance to most corrosive chemicals, solvents, and erosion. Another advantage is ease of field fabrication. For general service, Saran Lined Steel Pipe can be used at temperatures between —40° and 190°F.

Saran Lined Steel Pipe comes in maximum lengths of 10 feet and in sizes from 1 to 4 inches. Plug valves and fittings, also Saran Lined, include elbows, tees, companion and reducing flanges, and gaskets. AVAILABLE IMMEDIATELY. Write us today for further information concerning Saran Lined Steel Pipe and how it can solve your problem. Manufactured by The Dow Chemical Company, distributed nationally by Saran Lined Pipe Company.

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DOW
CHEMICALS INDISPENSABLE TO INDUSTRY AND AGRICULTURE

ated and N used to break the vacuum, after which the oil was bleached (a) in an atmosphere of N, and (b) while N was introduced vigorously below the surface.

That the beneficial effect of vacuum bleaching is due only to elimination of oxidation was demonstrated. Additional experiments showed that adsorbents catalyze the oxidation reactions, and that low pH earths respond better than earths of high pH to vacuum bleaching in improved color removal and oil stability.

Digest from "Oxidation Effects in Adsorption Bleaching of Vegetable Oils," by R. R. King and F. W. Wharton, *Journal of American Oil Chemists' Society*, 201-7, May, 1949.

MEATS

Proteolytic Enzyme Tenderizes Liver

Pretreatment of liver to tenderize the blood vessels that cause difficulty in chewing, without affecting the tenderness of the liver tissue, is the aim of a recently patented invention. Called for is the subjecting of liver to the action of a proteolytic enzyme, such as bromelin, trypsin or papain (in a 0.04-0.08 percent solution with or without curing materials), while under a vacuum of 25-27 in. Hg. Vacuum is maintained 10-30 min., then released and the liver removed and washed free of enzyme by means of water. Treated liver is refrigerated to maintain the enzyme associated with the blood vessels in a dormant state until the liver is cooked.

Digest from U. S. Patent 2,471,282, issued May 24, 1949, on an application dated June 16, 1945, to L. S. Paddock, assigned to Swift & Co., Chicago.

Pre-Freezing Processing Affects Poultry Quality

Quality of frozen poultry is affected by processing factors other than freezing. A bleeding time of 90 sec. following killing resulted in fewer defective birds and better feather removal by the rough plucker, than a 30 sec. interval. A period of 40 sec. in water at 128 F. was considered most favorable for feather removal. Optimum time and temperature depend on season and whether hand or machine plucking are used.

By eviscerating the birds and thrusting the breast surface of one into the eviscerated cavity of the next, the space required for packing birds weighing 60 lb. per doz. was reduced from 2,600 to 1,250 cu. in. The disadvantage of this method of packing is that birds

(New Technology Continued)

FINDINGS OF FACT CONFIRM HIGH VALUE OF ENRICHMENT

ENRICHMENT has been elevated to a new high level of national and social significance. The far-reaching Newfoundland Nutritional Surveys* have decisively demonstrated the part that flour and bread enrichment can play in reducing infant mortality, lowering the tuberculosis death rate and over-all death rate, decreasing signs of malnutrition, and increasing the alertness of children and grownups alike.

BEFORE ENRICHMENT

The first of these large-scale fact-finding surveys was conducted in 1944. Signs of malnutrition were widespread. Infant mortality and tuberculosis death rates were two to three times as high as in similar populations. Enrichment with thiamine, riboflavin, and niacin was then put into effect.

"Nutrition . . . has its significance in its relation to health. Health is defined in the World Health Constitution as follows: 'Health is the complete state of physical, mental and social well-being, not just freedom from disease and infirmity.'

"What can nutrition do? It can prolong life, give better bodies; make people happier, give them greater economic status; provide opportunity for greater social significance."

—National Health Assembly, May 1-4, 1948

AFTER ENRICHMENT

Four years later, in 1948, the second survey showed a dramatic reduction in signs and symptoms related to deficiencies of these essential nutrients. Gone to a great extent was the apathy so noticeable in 1944. Deaths from tuberculosis had decreased sharply, and the rate of stillbirths and infant deaths was strikingly reduced.

A CHALLENGE AND OPPORTUNITY

Here is a clear-cut confirmation of the high value of bread and flour enrichment to the national health. Here is a challenge to America's milling and baking industries, which have the enviable opportunity of bringing more buoyant health and greater physical and mental vigor to the people of America—through ENRICHMENT.

**These surveys were supported by the Newfoundland Government, the Newfoundland Tuberculosis Association, the individual investigators, and Merck & Co., Inc.* (The Canadian Medical Association Journal, *March 1945 and April 1949.*)

MERCK VITAMIN PRODUCTS
FOR ENRICHMENT AND FORTIFICATION

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For Millers, Bakers, Cereal and Macaroni Manufacturers Merck Enrichment Ingredients · Merck Vitamin Mixtures for Flour Enrichment · Merck Bread-Enrichment Wafers · Merck Vitamin Mixtures for Corn-Products Enrichment · Merck Vitamin Mixtures and Wafers for Macaroni Enrichment. Merck *Knows* Vitamins.

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. . . a perfect cleaning team

No more time-consuming hand-scraping or wire-brushing to clean walls, floors and equipment. Now all you do is switch on the Oakite Hot-Spray Unit, open up spray-gun valve and begin to wet down surfaces with hot cleaning solution.

Wheel-mounted, this mechanical spray-cleaner can be piloted around your plant for quick, easy operation wherever cleaning or paint-stripping is required.

Unit develops and delivers a controllable combination of the three most essential cleaning elements—heat, pressure and detergency. Delivers 1¾ gallons of hard-hitting cleaning solution per minute at 30 pounds pressure.

The Oakite Hot-Spray Unit has almost unlimited possibilities! Using specialized Oakite cleaning materials you can remove food residues from equipment, floors, tanks. You can strip paint with it. Many meat packers use it to derust and descale belly boxes and the like.

Use the Oakite Hot-Spray Unit and ONE man to speed up your cleaning chores, simplify them and REDUCE YOUR CLEANING COSTS. Your local Oakite Technical Service Representative will gladly give you details on models No. 482 and 451. Or write address below for descriptive data.

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OAKITE

INDUSTRIAL CLEANING MATERIALS • METHODS • SERVICE

freeze into a solid block unless they are separated by waxed paper.

The undesirable odor that develops in the thigh meat of poultry during frozen or chilled storage can be traced to the viscera of the birds. Poultry promptly eviscerated and frozen do not develop it. Its presence cannot be correlated with bleeding time.

Thawed birds retained their freshness about twice as long when they were dipped in a carageenin gel containing 6 percent NaCl. The gel is easily removed and the salt does not affect the palatability of the flesh. Dry chemicals dusted on the carcass did not improve the keeping of thawed birds. Cellophane-wrapped or partially cooked poultry deteriorated more rapidly than the controls.

Digest from "Frozen Storage of Poultry. V. Effects of Some Processing Factors on Quality," by J. A. Pearce and C. G. Lavers, *Canadian Journal of Research*, Vol. 27F, 253-65, June 1949.

BAKING

Thiamin Does Not Improve Baking Quality of Flour

Investigating the influence of thiamin on the baking quality of flour, a Dutch cereal chemist has been unable to reproduce the results claimed in a Dutch patent. According to the patent specification, addition of 3 and 6 mg. thiamin per kg. of flour exerts a volume improvement of 6.8 and 15.7 percent, respectively. Tests covered wide variations in type of flour, yeast concentration, dough consistency, and fermentation time.

In concentrations up to 12 mg. per kg. of flour, thiamin had no effect on the elastic properties of dough, although a slight stimulating action on fermentation was noted in concentrations up to 10 mg. The investigator concluded that, in the concentrations used, thiamin does not cause any improvement in breadmaking.

Digest from "Influence of Small Quantities of Thiamin on Baking Quality of Wheat Flour," by H. M. R. Hintzer, *Cereal Chemistry*, Vol. 26, 258-64, May 1949.

Additive Improves Icings

Improvement in the manufacture of icings by the addition of an algin stabilizer mixed with a suitable surface-active agent is the intention of a recent patent. It is claimed that this invention will improve texture and appearance and produce an icing easier to handle and apply to cakes than one to which the composition has not been added. Also claimed are faster whip-

(New Technology Continued)

These 34-foot Fruehauf Stainless Steel refrigerated semi-trailers, pulled by Autocar tractors, are owned by a Chicago, Ill., trucking company.

FOR REFRIGERATED TRAILERS

There's nothing like Stainless Steel!

REFRIGERATED TRAILERS that haul produce, meats, and other perishable food products are real targets for corrosion. But corrosion doesn't have a chance when these units are constructed from Stainless Steel.

Stainless has high inherent resistance to the effects of moisture and the brine, salt and ice solutions used for refrigeration. Equally important, Stainless is easy to clean and to keep clean—a fact proved in hundreds of uses throughout the food industry.

Along with spotless cleanliness and freedom from corrosion, Stainless Steel construction makes possible bigger payloads and bigger profits. Since Stainless is 2½ times as strong as ordinary steel, it permits construction that, while much lighter, is much stronger. The extra pounds of dead weight it eliminates become extra payload on every trip your trailer makes.

This combination of high corrosion resistance and maximum weight saving makes Stainless the ideal material, not only for refrigerated trailers, but for every type of highway hauling job. Add to this the longer life, lower maintenance, and pleasing appearance of Stainless Steel trailers, and it's easy to see why so many fleet operators call Stainless units "the best investment we ever made."

In U·S·S Stainless Steel, we offer you a *perfected*, service-tested Stainless that allows the widest latitude in design and the use of the most advanced manufacturing techniques. You'll get more for your money when you order equipment built from U·S·S Stainless Steel, because there's no better Stainless produced.

If you'd like to know more about the advantages of U·S·S Stainless, write for the booklet "An Introduction to Stainless Steel." Send your request to United States Steel Subsidiaries, 2094 Carnegie Building, Pittsburgh 30, Pa.

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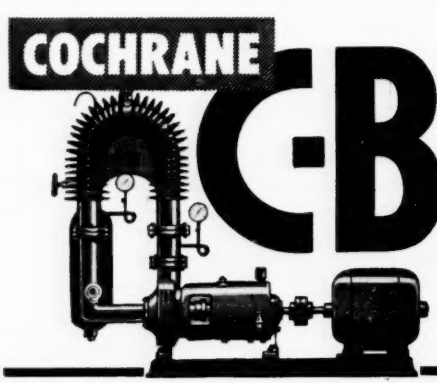
UNITED STATES STEEL

Unbelievable savings in fuel, surprising increase in speed of production, gratifying uniformity of quality, and freedom from the usual troubles attendant on the customary method of condensate removal are the results of the installation of the Cochrane C-B System. Fast, uniform heat, no flash loss, condensate returned to boilers at high temperature and high pressure . . . Write today for a copy of Publication 3250 and learn how you can secure these benefits in *your* plant . . . Cochrane Corporation, 3117 N. 17th St., Phila. 32, Pa.



ping, enhanced drying, and increased stability to changes in temperature and humidity. The surface-active agent may be a mixture of the mono- and diglycerides of the higher fatty acids, or a mixture of sorbitan esters of the higher fatty acids with the polyoxyethylene derivatives of such esters, or one or a mixture of the polyoxyethylene stearates.

Digest from U. S. Patent 2,474,019, issued June 21, 1949, on an application dated Mar. 10, 1947, to A. B. Steiner, and L. B. Rothe, assigned to Kelco Co., San Diego.

FRUITS AND VEGETABLES

New Apple Juice Process Holds Delicate Flavor

Apple juice in which the delicate fruit flavor is not masked by a typical cider taste is produced by a process developed at the New York State Agr. Expt. Station. Important change in the method of making the juice is addition of ascorbic acid, in an apple juice solution, to the apples during or immediately after milling, but before pressing. The ascorbic acid delays oxidation long enough to permit oxygen removal by deaeration, and enzyme inactivation by pasteurization. Juice may be concentrated to as high as 37 percent soluble solids by freezing. Juice or concentrate may be used in manufacture of an ice containing any desired percentage of apple juice, or for ice cream with 75 percent on the basis of original strength.

A pleasing, mild flavored apple ice was made with 79.2 percent apple juice, 20 percent sugar, 0.2 percent gelatin and 0.6 percent commercial stabilizer. A more pleasant, stronger flavored ice was made with 68 percent juice, 12 percent concentrate and 19.2 percent sugar.

Digest from "Apple Ice And Apple Ice Cream," by J. C. Hening, Journal Paper No. 799, New York State Agr. Expt. Station, Geneva, N. Y.

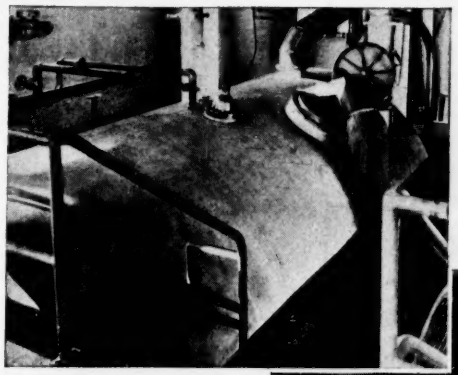
Preventing Discoloration Of Fruits and Vegetables

Raw potatoes and other fruits and vegetables may, it is said, be marketed in ready prepared form and kept fresh for relatively long periods without discoloration by a method disclosed in a recent patent. Reagents employed are dilute acetic acid (3-5 percent) and NaCl. The process consists of treating the potatoes with heat, in the presence of the above mentioned reagents, for a period sufficient to inactivate the enzymes responsible for discoloration, but insufficient to cause

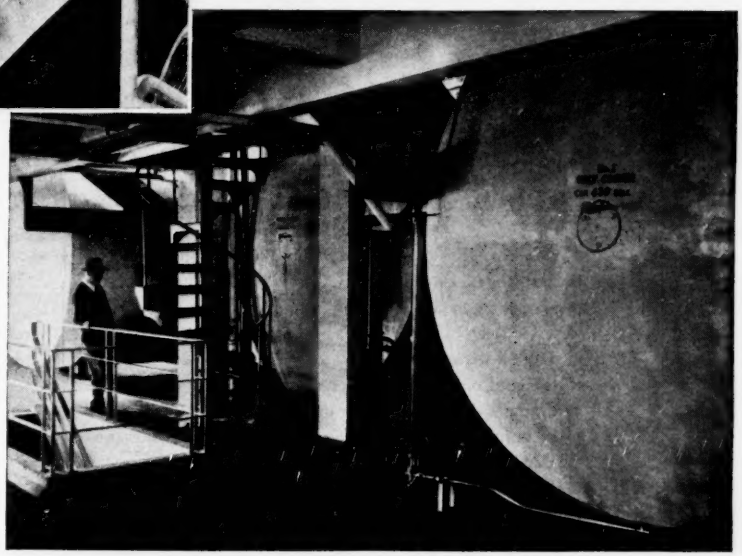
(New Technology Continued)

THESE NICKEL-CLAD STEEL COOKERS

protect the product AND reduce cleaning time



Close-up of one of the malt cookers.



Two 430-barrel malt cookers and one 345-barrel cereal cooker made of Lukens 10% Nickel-Clad Steel at Rubsam & Horrmann Brewing Company, Staten Island, New York. Built by Schoek, Gusmer & Co., Inc.

Malt and cereal cookers in Rubsam & Horrmann's new brewhouse are made of Lukens Nickel-Clad Steel. Thus the fine quality of R & H Beer is safeguarded—flavor, color and bouquet are preserved.

In operation, these clad steel cookers have revealed another advantage. Cleaning time has been greatly reduced, compared to their old equipment. Maintenance men report that at least two hours have been cut off of each weekly cleaning period. Mash does not cling to the smooth nickel surfaces and they can be effectively cleaned with little scrubbing.

Lukens makes a complete line of clad steels, enabling you to meet different conditions—Nickel-Clad, Stainless-Clad, Inconel-Clad and Monel-Clad Steels. In each, a uniform cladding of the corrosion-resistant metal is permanently bonded to a steel backing plate. All are available in the extra-smooth sodium hydride finish.

Ask your supplier to quote on equipment made of Lukens Clad Steels. Bulletin 449 tells you more about them. For a copy, write Lukens Steel Company, 401 Lukens Building, Coatesville, Pennsylvania.

CLAD METAL STEEL

Come see us at the Metal Show in Cleveland, October 17-21, Booth 503, and the Chemical Show in New York, November 28-December 3, Booths 558-563.

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OF APPRAISING FIRE PROTECTION

TO be best evaluated, fire protection must be considered in the light of known results . . results that when honestly measured, are evidenced in the qualities of *Assured Service* . . . *Approved Safety* . . . and *Accepted Savings.*

SERVICE From a *Service* point of view, "Automatic" Sprinklers stand on their record of past performance . . . safeguarding commercial and industrial enterprise from fire for over half a century . . . extinguishing small fires at their inception before major conflagrations can develop.

SAFETY "Automatic" Sprinkler's record of approved *Safety* is attested in the reports of all leading insurance authorities.

The fact that the cost of "Automatic" Sprinkler protection at Buhl Sons Company, Detroit, Michigan, will be paid for by means of reduced insurance rates in about 15 years (nearly 7% per annum), substantiates their acceptance as *Savings.*

SAVINGS

You will find it wise to plan adequate fire protection for your business property now, and in that planning, give careful consideration to those qualities of Service . . . Safety . . . and Savings. "Automatic" Sprinklers continue to offer all three. They're *an important investment today . . . perhaps welcomed protection tomorrow.*

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"Automatic" Sprinkler
FOR INVESTMENT PROTECTION
DEVELOPMENT · ENGINEERING · MANUFACTURE · INSTALLATION

changes in their raw and natural character. Cucumbers, eggplants, rutabagas, turnips, apples and unskinned bananas may be similarly treated.

Digest from U. S. Patent 2,472,017, issued May 31, 1949, on an application dated Sept. 12, 1946, to F. L. Iungerich, Webster Grove, and W. Peche, St. Louis.

MISCELLANEOUS

Powdered Salad Dressing Is Easily Reconstituted

A dried salad dressing that can be stored for long periods without substantial deterioration, and that can be mixed easily with an aqueous solution to produce a wet dressing, is the object of a recent invention.

The dressing is made in two steps. First, a powdered shortening is prepared as follows: Water and flour or starch are mixed and the starch is gelatinized by boiling. Then, an edible, hydrogenated fat is mixed with the gelatinized starch, and the mixture is spray dried. It is preferable to add sugar to the water-flour (or starch) mixture prior to gelatinizing. In the second step, the shortening is mixed with powdered egg yolk and condiments such as salt, dry mustard, paprika, mace, white pepper and pulverized citric acid.

Fresh salad dressing is made by mixing the dried product with water, fruit or vegetable juices, or other liquids, while stirring or whipping.

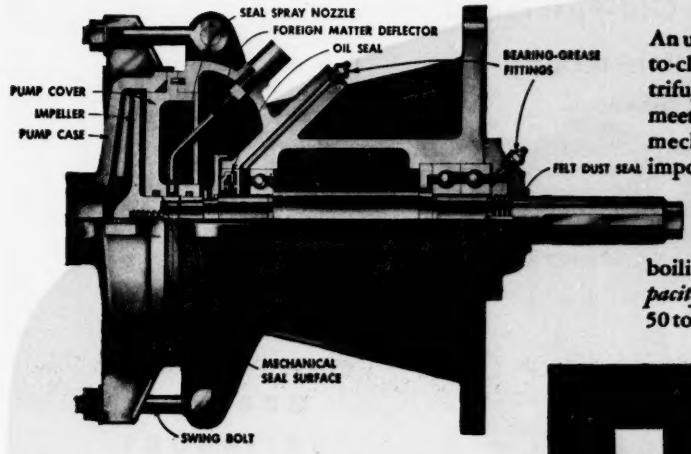
Digest from U. S. Patent 2,471,434, issued May 31, 1949, on an application dated Feb. 18, 1946, to M. H. Kimball, C. G. Harrel and R. O. Brown, assigned to General Mills, Inc.

Wax-Dipped Berry Boxes Resist Mold Growth

Mold growth on berry boxes, which has become a serious problem in the Pacific Northwest, may be greatly reduced by coating the boxes with wax. This film also assists in removal of infected organic matter when boxes are washed prior to return to field.

Recommended coating mixture consists of 5 percent microcrystalline wax, melting point 160-165 F., and 95 percent standard paraffin, m.p. 143-150. Boxes should be air dried, free from sawdust, wood fibers and other foreign matter. Dipping temperature is 15-20 deg. above m.p. of wax mixture, with time of dip not less than 15 sec. and drainage time approximately 40 sec. Material cost is estimated at $3.80 per 1,000 boxes.

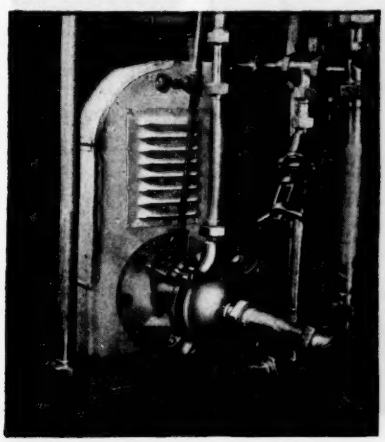
Digest from *Tentative Recommendations For the Treatment of Berry Boxes (Hallocks) to Reduce Mold Growth*, by E. J. Barta and E. Lowe, AIC-239, USDA, Agr. Research Administration, Bureau of Agr. & Ind. Chemistry.



An unusually compact, easy-to-clean, selective speed centrifugal pump...designed to meet exacting sanitary and mechanical requirements imposed by food evaporation processes that operate under high vacuums and high boiling temperatures. *Capacity:* 20 to 100 gpm. *Head:* 50 to 200 ft. *Speed:* Selective.

The New BJ Sanitary Food Process Pump

This is one of a large number of BJ Sanitary Food Process Pumps installed by Golden State Co., Ltd. For standard application, pump is mounted on sturdy sheet-metal cabinet containing drive motor, as indicated. Selective Vee-belt drive provides for flexible adaptation to variable power and speed conditions. Discharge nozzle can be rotated to any one of four positions. If desired, pump is sold separately for special mounting.



CONVENIENT DISMANTLING AND CLEANING—Pump can be dismantled for cleaning with a few simple manipulations. Case is held by four swing bolts, impeller by a simple bolt threaded into impeller hub.

MECHANICAL SEAL—A simple, water-cooled-and-lubricated mechanical seal assures a trouble-free, easily cleaned stuffing box.

STANDARD SANITARY FITTINGS—Suction and discharge nozzles are machined to receive standard sanitary fittings.

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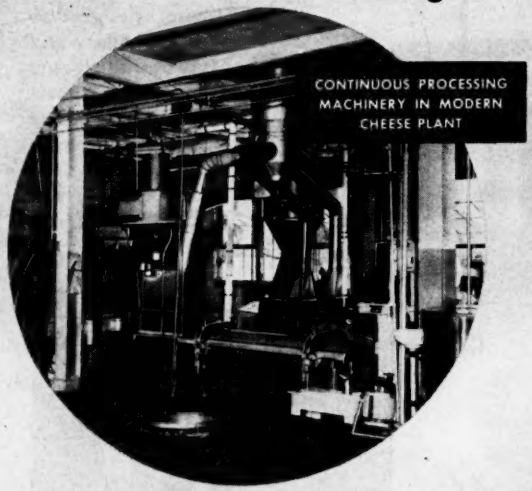
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Books

Soybean Process

EXTRACTION OF SOYBEAN OIL BY TRICHLOROETHYLENE. *By O. R. Sweeney, L. K. Arnold and E. G. Hollowell. Published by Iowa Engineering Experiment Station, Iowa State College, Ames, as Bulletin* 165. 89 *pages; 6x9 in.; paper. Free.*

First of all, the authors here establish solid economic reasons why small scale soybean oil extraction plants, near to their sources of raw materials, are desirable. They then proceed with the technical and practical problems involved in building and operating such a plant.

The bulletin covers the technical aspects of the process from the characteristics of the material to commercial plant operation. This information should prove highly valuable to food chemists interested in soybeans.

Nazi Food Developments

THE FOOD MANUFACTURING INDUSTRY IN GERMANY, 1939–1945. *Published in His Majesty's Stationery Office, York House, Kingsway, London, W. C.2.* 134 *pages; 6x9⅝ in.; paper. Price, 2s.*

Publication of this report brings under one cover the developments that most of us have been hearing about piecemeal since the beginning of World War II.

Just about every food classification is included, although few if any of the operations will excite more than mild interest among U. S. food producers. The section on egg-albumen substitutes offers probably the most promising field in the book for further consideration in this country.

Flavor and Light

ADVANCES IN ENZYMOLOGY, *Vol. 9. Edited by F. F. Nord. Published by Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y.*, 1949. 760 *pages; 6¼ x 9¼ in.; cloth. Price,* $9.

Two papers in this latest volume of critical reports are of particular interest to the food technologist. M. A. Joslyn's paper, "Enzyme Activity in Frozen Vegetable Tissue," covers the enzymic nature of flavor changes, scalding for flavor retention, and the catalase and peroxidase activity as an index of scalding efficiency.

"Photochemistry of Enzymes, Proteins and Viruses," by Douglas McLaren, includes a discussion of the effect of light on the physical and chemical properties of proteins, amino acids, peptides and enzymes. These light-induced changes may cause denaturation of the protein, altering odor, color, viscosity, solubility and coagulation.

Research Aid

OUTLINES OF BIOCHEMISTRY, *3rd Edition. Edited by Ross Aiken Gortner, Jr., and Willis Alway Gortner. Published by John Wiley & Sons, Inc.,* 440 *Fourth Ave., New York* 16, *N. Y.*, 1949. 1078 *pages; 6¼ x 9¼ in.; cloth. Price,* $7.50.

Changes that have taken place in general biochemistry since the appearance of the second edition, in 1938, make this third edition welcome to the food chemist.

The authors first lay the foundation for this study with a detailed chapter on colloid systems. Subsequent sections discuss proteins, carbohydrates, fats, lipids and essential oils, plant pigments and, finally, biochemical regulators.

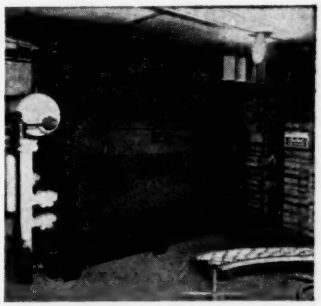
Chapters added in this edition deal with protein denaturation, and carbohydrate and lipid metabolism. Many of the repeated chapters have been rewritten or altered extensively.

Government Publications

THE INSTABILITY OF ASCORBIC ACID IN WATER, WITH ADDED COPPER OR HYDROGEN PEROXIDE, OR BOTH. By R. W. Bell and T. J. Mucha. Bureau of Dairy Industry, BDIM-1062, June 1949. Mimeographed. DEFERMENT OF AN OXIDIZED FLAVOR IN FROZEN MILK BY ASCORBIC ACID FORTIFICATION AND BY HYDROGEN PEROXIDE OXIDATION OF THE ASCORBIC ACID OF THE FRESH MILK. By R. W. Bell and T. J. Mucha. Bureau of Dairy Industry, BDIM-1063, June 1949. Mimeographed. These are abstracts from papers prepared for annual meeting of American Dairy Science Assn., June 1949.

PUBLICATIONS AND PATENTS OF THE EASTERN REGIONAL RESEARCH LABORATORY, 1939–1948. Bureau of Agricultural & Industrial Chemistry, AIC-180, including Supplements 1 and 2. Mimeographed.

SOME OBSERVATIONS ON THE RELATIONSHIP OF QUALITY OF FRESH SOUR CHERRIES TO THEIR PROCESSED PRODUCTS AND EFFECTS OF PROCESSING ON VARI-



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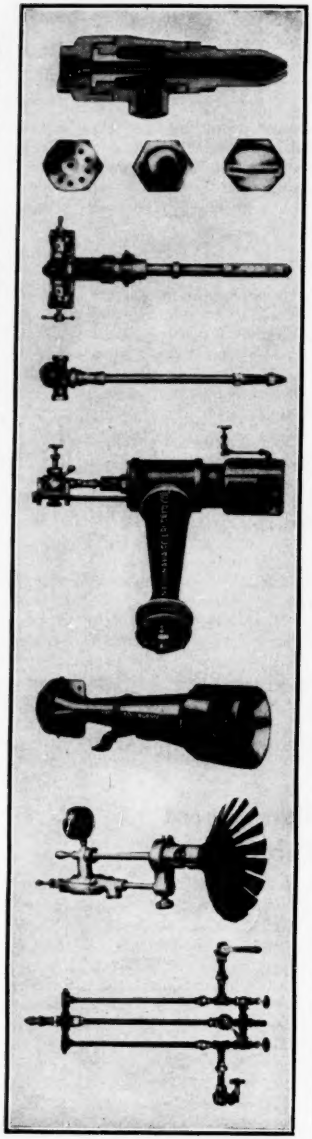

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OUS TYPES OF DEFECTS. By E. R. Thompson and R. L. Spangler. Production & Marketing Administration, Department of Agriculture, June 1949. Mimeographed.

PACKAGES FOR SHORTENING, SALAD OIL, AND COOKING OIL. National Bureau of Standards, Simplified Practice Recommendation R193-49. (Supersedes R193-42). Price 5c. A recorded voluntary recommendation of the trade.

RECOMMENDED SPECIFICATIONS FOR STANDARD PACKAGES AND PACKS FOR FROZEN EGGS. Production & Marketing Administration, Department of Agriculture, March 1949. Mimeographed. First recommended standards and uniform terminology for use as a common basis for buying, selling and discussion.

COOPERATIVE MARKETING OF APPLES IN THE UNITED STATES. By J. H. Heckman and G. H. Goldsborough. Farm Credit Administration (Department of Agriculture), Bulletin 55. Price 25c.

MARKETING PRACTICES OF COOPERATIVES PROCESSING CANNED AND FROZEN FRUITS AND VEGETABLES. By Anne L. Gessner. Farm Credit Administration (Department of Agriculture), Miscellaneous Report 130. Mimeographed.

ECONOMIC INDICATORS. New monthly publication of Congressional Joint Committee on the Economic Report. Price $1.75 per year.

PURCHASED ITEMS AND PURCHASING LOCATIONS OF THE DEPARTMENT OF THE ARMY. By Current Procurement Branch, Logistics Division, General Staff, U. S. Army, July 1949. Mimeographed. Available from Procurement Information Center, The Pentagon, Washington 25, D. C. A pamphlet designed to assist small business.

COMMODITY CODE BOOK. Economic Cooperation Administration, June 15, 1949. Available from Office of Information, Economic Cooperation Administration, Washington 25, D. C. Contains groups into which all food, agricultural and industrial commodities, as well as services and transportation costs, may be classified, together with ECA numbers which identify each group. Supersedes Sept. 10, 1948 Edition.

The above recently issued documents are available, at the prices indicated, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. When no price is indicated the pamphlet is free and should be ordered from the bureau responsible for its issue. —*End*

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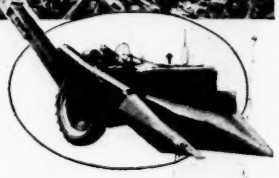

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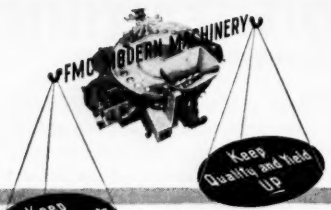

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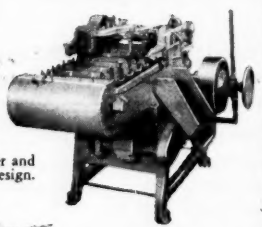

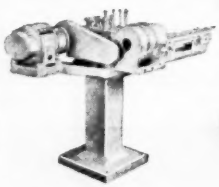

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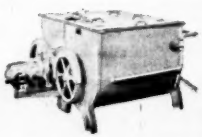

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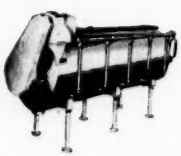

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Patents

Freshly Baked Soft Loaves of Bread Temporarily Packaged for Delivery in Tubes With Rectangular Cross Sections—*R. W. Thomas, to Quality Bakers of America, New York City. No. 2,472,993. June 14, 1949.*

Ground Peanut Hulls Combined With Copolymer of Vinyl Chloride and Vinyl Acetate With Plasticizer to Form Plastic Molding Mix—*H. M. Kulman, to Kulastic Co., Inc., Atlanta. No. 2,473,030. June 14, 1949.*

Tenderness of Food Material Mechanically Determined by Shear Resistance to Reciprocating Blades—*C. E. Kerr, to Food Machinery & Chemical Corp., Hoopeston, Ill. No. 2,473,063. June 14, 1949.*

Vegetable Oil Containing Gamma Tocopherol Treated With Hydrogenated Gas in Presence of Metallic Catalyst and Hydroperoxide to Form Soap—*W. Lange and R. G. Folzenlogen, to Procter & Gamble Co., Ivorydale, O. No. 2,473,154. June 14, 1949.*

Fruit Dried by Contacting With Edible Liquid of Low Vapor Pressure at 70 to 100 Deg. C. and Pressure Less than ½ Psi. Absolute—*W. A. Webb, San Jose, Calif. No. 2,473,184. June 14, 1949.*

Casein Modified For Food Use by Digesting With Pepsin in Presence of Ammonium Sulphate—*I. A. Parfentjev, to American Cyanamid Co., New York City. No. 2,473,255. June 14, 1949.*

Hops Frozen to Retain Fresh Aroma, Held Frozen in Storage and Thawed Prior to Drying—*G. Segal, Great Neck, N. Y. No. 2,473,395. June 14, 1949.*

Ice Cream Cones Baked in Electrically Heated Mold—*M. E. Wood, Staten Island, N. Y. No. 2,473,402. June 14, 1949.*

Fluid Milk Heated to About 150 F. With Mineral-Modified Milk Solid (Calcium to Phosphorus Ratio of 0.15 to About 0.75) to Control Viscosity and Curd-Forming, Then Evaporated—*H. E. Otting, L. H. Chrysler and E. F. Almy, Columbus, O., to M & R Dietetic Laboratories, Inc. No. 2,473,493. June 14, 1949.*

Oyster Shells Opened by Mechanical Means—*J. L. Plock, Southhold, N. Y. Nos. 2,473,608 and 2,473,609. June 21, 1949.*

Green Vegetable Color Preserved by Soaking in Dilute Solution of Ammonium Hydroxide Before Canning—*L. F. Giesecker, Preble, Ind. No. 2,473,747. June 21, 1949.*

Riboflavin Produced by Growing Fungus *Eremothecium ashbyii* in Medium Containing Protein, Malt Extract and Sugar—*A. S. Phelps, to American Cyanamid Co., New York City. No. 2,473,817 and 2,473,818. June 21, 1949.*

Bakery Icings Stabilized by a Hydrophilic Colloid and a Surface-Active Agent—*A. B. Steiner and L. B. Rothe, to Kelco Co., San Diego. No. 2,474,019. June 21, 1949.*

Lactic Acid Produced From Waste Sulphite Liquor Containing Lignins, Sugars and Free and Loosely Combined Sulphur Dioxide—*K. W. Fries, to Rhinelander Paper Co., Rhinelander, Wis. No. 2,474,046. June 21, 1949.*

Food Frozen During Passage Through Tunnel Equipped With Distributing Ducts and Diffuser Apparatus—*A. Silvera, to Carrier Corp., Syracuse, N. Y. No. 2,474,069. June 21, 1949.*

Clear Liquid From Fermented Mash Treated With Activated Carbon for Removal of Acetone and Butyl Alcohol—*M. Sulzbacher, to Butacet Ltd., London, England. No. 2,474,170. June 21, 1949.*

Fruit Juice Made Resistant to Microorganisms by Treatment With Dehydroacetic Acid or Its Sodium, Potassium, Ammonium, or Calcium Salts—*G. H. Coleman, and P. A. Wolf, to Dow Chemical Co., Midland, Mich. Nos. 2,474,226 and 2,474,227. June 28, 1949.*

Foods Rich in Proteins and/or Fats Given Increased Resistance to Microorganisms by Treatment With Small Quantities of Dehydroacetic Acid or Its Sodium, Potassium, Ammonium, or Calcium Salts—*G. H. Coleman and P. A. Wolf, to Dow Chemical Co., Midland, Mich. No. 2,474,228. June 28, 1949.*

Light Alcoholic Beverages Given Increased Resistance to Microorganisms by Addition of Small Amount of Dehydroacetic Acid or Its Sodium, Potassium or Ammonium Salts—*G. H. Coleman and P. A. Wolf to Dow Chemical Co., Midland, Mich. No. 2,474,229. June 28, 1949.*

Apricots Mechanically Halved and Pitted—*Joseph Perrelli and John Perrelli to Perrelli Freestone Machine Inc., Richmond, Calif. No. 2,474,492. June 28, 1949.*

Vegetables Blanched to Inactivate Enzymes by Subjecting to High Frequency Electric Field in Atmosphere of Predetermined Humidity—

(Patents Continued)

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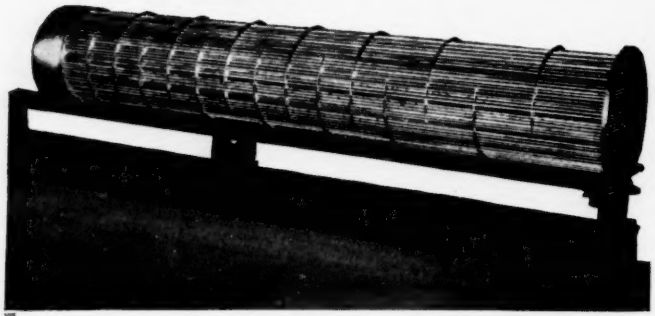

The above photo is of a bimetallic tube Heat Exchanger. These tube bundles incorporate many tubes. The tubes are ¾" O. D. steel, .083" thick, with a liner of 70-30 cupro-nickel which is .049" thick. Downingtown developed techniques allow installation of these tubes without abnormal damage to the liner when the tube is rolled into the tube sheet, and at the same time to make sure a permanent seat is obtained between the tube and tube hole. Downingtown has made bimetallic tube ammonia condensers as large as 6' in diameter, with 2" 12 gauge steel tubes having .049" copper liners, securely rolling the tube into the tube sheet without damage to the copper liner. This specialized technique is available for other combinations of metals, such as stainless steel with cupro-nickel or other liners.

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Alloy materials, including aluminum, inconel, nickel, phosphor bronze, or welded copper. Many of these are welded by Heliarc. Bimetal and finned tube jobs, to our own performance designs. Karbate jobs for very high corrosion resistance. Special stainlesses, for difficult service conditions.

Design and construction meet standards of A.S.M.E. or other agency specified by customer. All equipment of our design is sold on a guaranteed performance basis. We also fabricate to customer's drawings. Modern facilities available for checking of welding operations by X-Ray. Write on your letterhead for Downingtown literature on shell and tube heat exchangers.

DOWNINGTOWN IRON WORKS
DOWNINGTOWN, PA.
HEAT EXCHANGERS

C. Birdseye to Dehydration Inc., Gloucester, Mass. No. 2,474,649. June 28, 1949.

Vegetables Subjected to High Frequency Electric Field to Inactivate Enzymes Without Leaching, While Removing Moisture Content by Evaporation Before Coating With Proteolytic Enzyme Solution and Dehydrating —C. Birdseye to Dehydration Inc., Gloucester, Mass. No. 2,474,650. June 28, 1949.

Ice Cream Made in Continuous Freezer Fitted With Perforated Screw Agitator—G. H. G. Espinasse and J. P. C. Espinasse, Ales, Gard, France. No. 2,474,730. June 28, 1949.

Partial Esters of Glycerine and Fatty Acids Made to Have Larger Number of Free Hydroxyl Groups Than Starting Glycerides Possess—M. H. Ittner, deceased, to Colgate-Palmolive-Peet Co., Jersey City, N. J. No. 2,474,740. June 28, 1949.

Grain Fortified With Water-Soluble Vitamin and Coated With Non-Toxic Material Consisting of Prolamine, Saturated Higher Fatty Acid and Abietic Acid—M. F. Furter, and W. M. Lauter, to Hoffman-La Roche, Inc., Nutley, N. J. No. 2,475,133. July 5, 1949.

Wheat Flour Slurry Aged in Water From 10 to 50 Hours to Give pH Less Than 7 Preliminary to Recovery of Wheat Starch—R. L. Slotter and J. M. Toumy, Peoria, Ill. to U. S. A. No. 2,475,261. July 5, 1949.

Ground Meat Extruded Into Casing, Tied Off Into Units Similar to Link Sausage and Cooked Sufficiently to Become Rigid Upon Cooling and to Permit Slicing—C. T. Smelzer, to Clarnel Food Products Corp., New York City. No. 2,475,408. July 5, 1949.

Edible, Non-Toxic Liquid Oil of Nondrying Type Obtained by Extraction of Pits and Kernels of Olives—F. C. Battistella to R. E. Bishop, New York City. No. 2,475,419. July 5, 1949.

Natural Fat Containing Stearic Acid Hydrolyzed, Distilled, and Treated to Produce Light-Colored Commercial Stearic Acid—A. C. Brown and V. J. Muckerheide to Emery Industries, Inc., Cincinnati. No. 2,475,420. July 5, 1949.

Plastic Food Material Contained in Reservoir Hopper Mechanically Forced Through Rotating Divider Mechanism and Discharged Under Pressure Into Shape-Forming Mold—S. Santo, Deep River, Conn. No. 2,475,463. July 5, 1949.

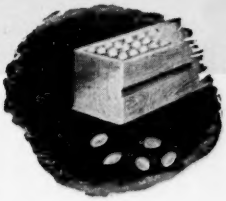
Precooked Dried Flour or Meal Made From Peas and Beans by Cooking and Drying on Rotary Drum at Temperature Above Gelatinization Point, Pressing Into Thin Layer to Complete Drying, and Grinding—F. A. Moller, to N.V.W.A. Scholtens Chemische Fabrieken, Hoogezand, Netherlands. No. 2,475,554. July 5, 1949.

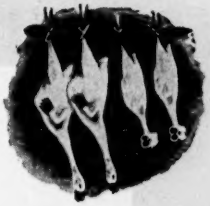
Fruit Cored and Juice Extracted in Same Manually Operated Machine—G. E. Wilson, Ft. Lauderdale, Fla. No. 2,475,559. July 5, 1949.

Peaches, Nectarines and Apricots Dipped in Water Solution Containing Inorganic Chloride, Ascorbic Acid, and Sulphiting Agent to Prevent Browning—G. Johnson, and D. G. Guadagni, Albany, Calif. to U. S. A. No. 2,475,838. July 12, 1949.

Provitamin D Obtained From Natural Sterol Contained in Saponified Fat of One Species of Mussel—H. R. Rosenberg to E. I. du Pont de Nemours & Co., Wilmington, Del. No. 2,475,917. July 12, 1949.

(Patents Continued)





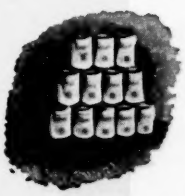
Along with many other specialized types of General American cars, this refrigerator car serves the nation's shippers.

GENERAL AMERICAN

Whether you ship fruits or vegetables, meats or liquids, there is a General American Refrigerator car equipped to handle your products.

To serve you further, General American representatives located in most major producing areas are ready to help you solve your own individual shipping problems quickly and economically.

So whatever and wherever you ship, you may take advantage of General American's 50 years of experience serving the nation's shippers. And you may rely absolutely on General American's outstanding reputation for complete dependability.



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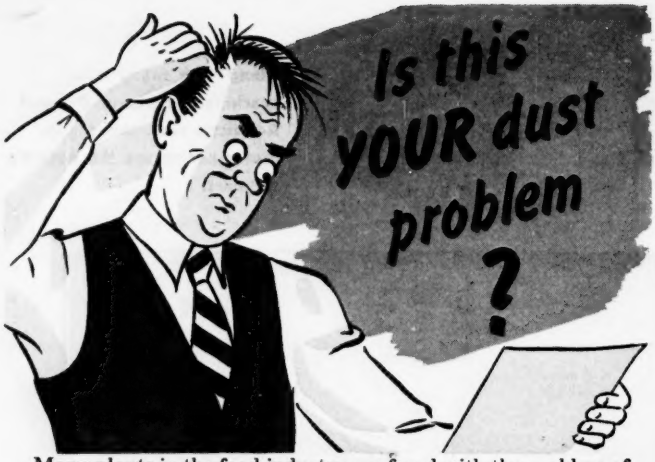
builds and operates specialized refrigerator cars for shipments of all kinds of perishables

UNION REFRIGERATOR TRANSIT LINES, MILWAUKEE

A Division of General American Transportation Corporation, Chicago 90



Many plants in the food industry are faced with the problem of securing continuous dust recovery with constant air volumes. This cannot be achieved when dust filter sections must be shut down for cleaning or rapping. Shutting down sections overloads the balance of the equipment, builds up high back pressures and reduces air volumes.

If your plant has this problem, The **DAY** Company can help you solve it!

The new DAY "Autoclean" Dust Filter is the Answer

Licensed by H. J. Hersey, Jr.

The **DAY** "Autoclean" Dust Filter was designed for industries requiring continuous-automatic filtering with constant air volumes and provides:

1. **Continuous-automatic operation with a minimum of excess cloth area.**
2. **Constant air volumes.**
3. **Parallel air flow.**
4. **Higher cleaning efficiency.**
5. **No flat surfaces or ledges within filter to accumulate dust.**
6. **Economical first cost, operation and maintenance.**

Actual installations are operating successfully with air to cloth ratios of 15 or 20 to 1, and with back pressures of only 1 to 2 inches water gauge. Such performance is made possible by the type of filtering felt used and the gentle, yet effective action of the continuous reverse jet cleaning mechanism.

***Write-to-DAY* for New "Autoclean" Dust Filter Bulletin No. 491.**

DAY SINCE 1881

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IN CANADA: P. O. Box 70D, Ft. William, Ont.
Branch Plants in Ft. Worth, Buffalo and Welland, Ont.

Patents

Tea Extract Made by Steam-Distilling Tea Leaves, Extracting Leaf Residue With Boiling Water, Concentrating Water Extract and Mixing Distillate With Extract Concentrate—*D. K. Tressler, Westport, Conn. No. 2,476,072. July 12, 1949.*

Partially Roasted and Shelled Cocoa Bean Nibs Treated With Solution of Sodium Carbonate and Sodium Potassium Tartrate and Given Second Roasting Preliminary to Making Into Cocoa—*H. M. Hintemann, Jersey City, N. J. 50 percent to H. Ricker and Sons, Poland Spring, Maine, 24 percent to H. E. Jones, Cambridge, Mass. 1 percent to F. T. Cotter and 1 percent to G. E. Cotter, both of New York City. No. 2,476,092. July 12, 1949.*

Citric Acid Produced by Submerged Oxidative Fermentation With *A. niger* in Carbohydrate Medium Containing Ammonium Carbonate and Morpholine—*L. B. Schweiger and R. L. Snell to Miles Laboratories Inc., Elkhart, Ind. No. 2,476,159. July 12, 1949.*

Sour Rye Cultures for Bread Made by Progressive Multistep Fermentation of Rye Flour, Water and Yeast Sponge, Drying Sponge for 48 Hr. at 50 Deg. F. and Grinding to Flour Fineness—*H. Ginsburg, Atlantic City, N. J. No. 2,476,242. July 12, 1949.*

Eggs Inoculated With Reducing Sugar-Fermenting Organisms, Fermented and Dried—*B. R. Harris, to The Emulsol Corp., Chicago, Ill. No. 2,476,412. July 19, 1949.*

Donuts Made in Deep Fat Frying Machine Equipped With Means to Direct Flow of Cooking Fat Along Entire Channel Donuts Travel—*P. J. Toews to Dough-King Inc., Minneapolis, Minn. No. 2,476,467. July 19, 1949.*

Bread Packaged in Container Having Tear Strip and Reinforced Reclosable Member—*S. Rosen, to Milprint, Inc., Milwaukee, Wis. No. 2,476,564. July 19, 1949.*

Dry, Powdered Beverage Mix Containing Irish Moss or Iceland Moss and Herbs—*C. H. Bloss to C. H. Bloss Corp., Chicago. No. 2,476,581. July 19, 1949.*

Chewing Gum Given Dental Therapeutic Properties by Inclusion of Reducible Silver Compound Which is Present in Reduced State in Finished Product—*J. A. Smith to Southern Research Laboratories, Memphis, Tenn. No. 2,476,687. July 19, 1949.*

Wheat and Rye Mashes for Alcoholic Fermentation Containing Clay Filter Aid and Decolorizing Agent—*L. Wallerstein to Wallerstein Co., Inc., New York City. No. 2,476,785. July 19, 1949.*

Packaged Food Containers Edibly Coated With Gelatin, Vegetable Adhesive and Small Amount of Levulinic Acid to Retard Mold Growth—*W. F. Bollens to Swift & Co., Chicago, Ill. No. 2,476,802. July 19, 1949.*

Fruits, Meats and Vegetables Comminuted During Vertical Passage Through Rotating Unit Equipped With Bottom Discharge and Reciprocal-Acting Closure for Discharge Opening—*J. A. Hohman, Baltimore, Md. No. 2,476,867. July 19, 1949.*

Sugar Cane Wax Recovered by Organic Solvent After Compressing Mud, Dewatering to Moisture Content of 36 to 42 Percent and Drying Into Rod-like Coherent Mass—*W. F. Goepfert, to Interchemical Corp., New York City. No. 2,476,974. July 26, 1946.*

—End

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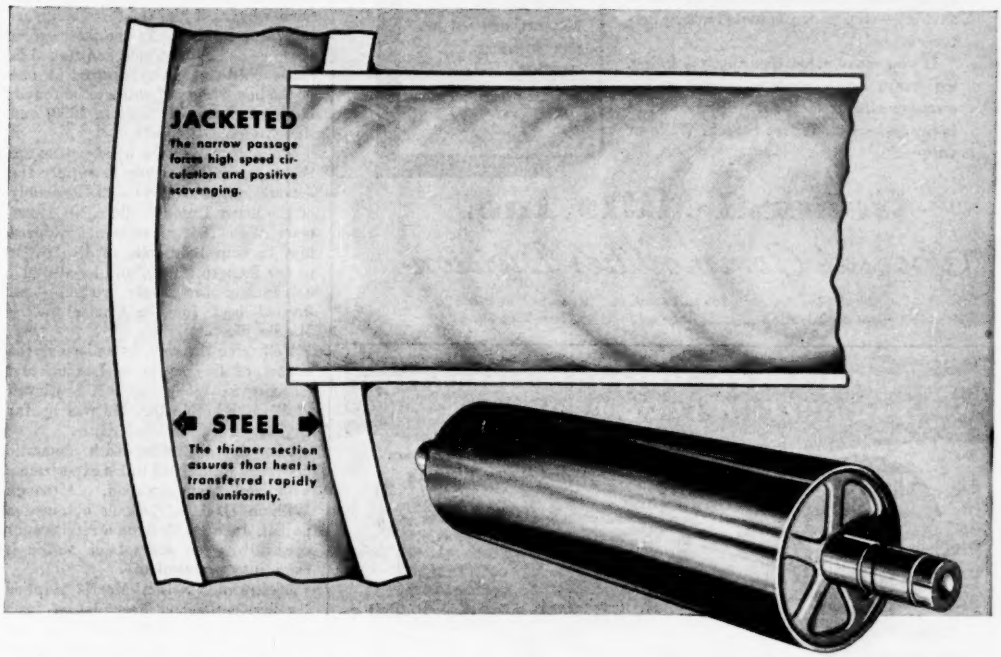
from steam (or coolant) *this way*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The narrow passage forces high speed circulation and positive scavenging.
STEEL
The thinner section assures that heat is transferred rapidly and uniformly.

Lukenweld Jacketed Steel Rolls move heat rapidly—in or out. Their welded steel plate construction permits thin sections. Whether the task is heating or chilling, surface temperatures are more uniform and constant.

High steam pressures are employed with safety with Lukenweld Rolls. Records covering dozens of installations in a variety of industries show production increases of more than 60% over old style rolls. Bulletin 358 tells you more about them.

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Put Your Products Wheat on a Starch Diet

Sales go up and costs go down when you use General Mills Modified A-22 Wheat Starch in your food products. The unique properties of this starch permit ingredient savings—keep your products looking better—*longer!*

If you make salad dressing, pie filling, ice cream cones, candies, dessert mixes, soups or similar foods, it will pay you to investigate A-22 Wheat Starch. Write or wire—

- No cereal taste or odor.
- Greater absorption and thickening power.
- Clear sols, clear firm gels.
- High temperature resistance.
- Dust-free crystalline form (powdered on order.)

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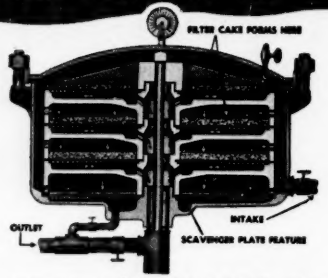
FOR HIGH SPEED, UNIFORM FILTRATION REQUIRED IN FOOD PROCESSING

SPARKLER *horizontal plate* FILTERS

Capacities 50 G.P.H. to 5000 G.P.H.



HERE ARE A FEW FOOD PRODUCTS THAT SPARKLER FILTERS HANDLE WITH EASE:

Candy Scrap
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Cider
Egg Albumen
Extracts
Flavors
Honey
Gums
Liquors
Milk
Molasses
Vegetable Oil
Syrups
Vinegars
Wines
Fruit Juices
Alcohols
Alkalies
Beverages

Sparkler Filters operate on a distinctive principle, using horizontal plates, that are particularly efficient in maintaining uniformity in operation over a wide range of pressure, temperature, or viscosity conditions.

Filters water sparkling clear, removes all off-tastes, odors, color, sediment, chlorine, sulphur, algae, pipe rust, etc.

Because filter media are supported on a horizontal plane and filter aids floated into position uniformly, filtration takes place uniformly over entire filtering areas. Flow through filter is always with gravity. The patented scavenger plate filters the last drop, leaving no hold over in batch filtration.

We invite correspondence on your problems. You will receive the advice of filtration engineers with over a quarter of a century experience in a specific field.

SPARKLER MANUFACTURING COMPANY
MUNDELEIN, ILLINOIS

What Readers Think

—Continued from page 90

area of Germany, Jan. 21, 1839. Following the 1848 revolutionary movement, his family, like many others, suffered exile from their homeland.

The 11-year-old boy landed in Philadelphia, in 1850 and walked to New York, where he found a job hauling charcoal. At 15 he reached Chicago, where he found work in the old Myrick Stock Yards. Within a month he had decided upon his future, and never deviated from his plans.

From his employer, John B. Sherman, so closely related to the Chicago livestock market, he drew encouragement which led him to start slaughtering cattle in 1859. In the intervening years he had bought, sold and traded in cattle until he was recognized as one of the best judges of cattle to be found. His first plant was built in 1859, and slaughtered cattle only.

The outbreak of the war between the States found him ready to supply the demand which followed the assembly of the many Union soldiers. His contract with the government required him to ship thousands of live cattle to the Eastern killers, and he also had a contract to supply virtually all dressed beef for the armies in the Middle West.

Following the war, he undertook the export of live cattle to London and Glasgow in 1868, and this continued until after his death. He was by far the largest exporter of cattle.

His dissatisfaction with domestic deliveries of beef led to his experiments with rail transportation. Although William Davis of Detroit obtained a patent, June 16, 1868, on a refrigerator car, it was ten years later before it came into practical use.

Meanwhile, Nelson Morris shipped the first carload of dressed beef from Chicago to Boston in 1869. It was shipped in a box car during the winter.

The railroads were content to haul live animals, and did naught to encourage the perfection of the refrigerator cars. It was necessary for the major packers to build their own equipment, and Mr. Norris was always pushing his plans for this.

In March, 1879, the first cargo of refrigerated beef was shipped by his firm to England on the steamship *Circassian*.

Later, in 1879, he built his first hog killing plant, the better to compete with other packers.

His wizardry in the packing industry led him inevitably into the production field. He owned and leased tremendous ranches in Texas, Nebraska, South Dakota and later in Mexico. His operations were syn-

THE BEST LIFT TRUCK FOR INSIDE WORK

MOVE MORE MATERIALS

Inside your plant with a HYSTER® LIFT TRUCK

The complete Hyster line of trucks—7 models (2,000 lb. to 30,000 lb. capacity) are gasoline powered; all are equipped with pneumatic tires. Illustrated at top of page is Hyster 20; above, Hyster 40.

Saves Floors...Cuts Maintenance Costs. More Speed, More Traction, More Maneuverability.

The Hyster Pneumatic Tire "Easy Ride" is easy on floors—easy on the load—engineered for greater maneuverability in narrow aisles and crowded warehouse spaces. HYSTER IS THE IDEAL LIFT TRUCK FOR INSIDE WORK.

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Whether your product goes to the consumer in bottles or cans, odd shapes, boxes or bags, there's an S & S packaging machine with speeds to suit your needs.

Our Engineering staff is always available to help in the solution of your packaging and filling problems.

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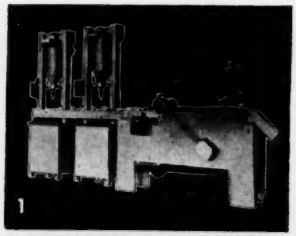
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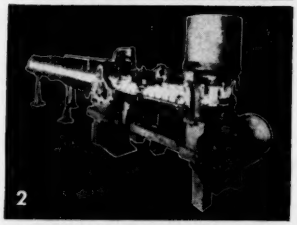
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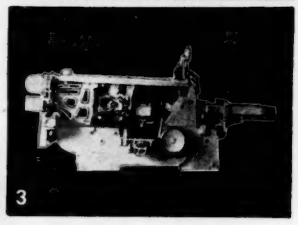
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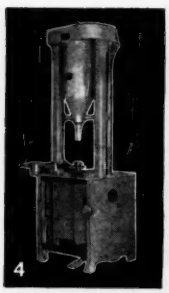
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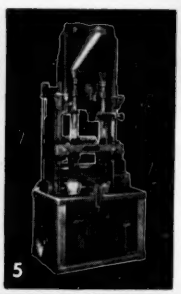
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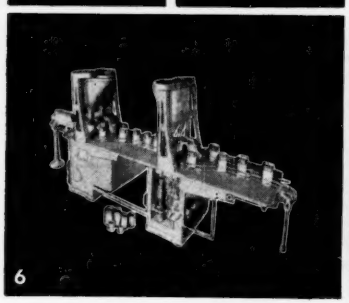
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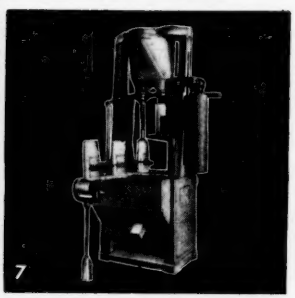
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Subsidiary of Food Machinery and Chemical Corporation

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ANDERSON-BARNGROVER DIVISION OF FMC
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chronized with the greatest feeding operations ever contracted for, virtually all of the distillery feed available. The story would fill a book.

Thousands of carloads moved from ranch to ranch, to feed yards, and from feed yards to market or packers.

His two sons, Edward and Ira Nelson, took over his packing operations, but Mr. Morris continued his active interest in the live cattle business, as long as he lived.

With all of his business activities, he was always a leader in civic activities, and his donations to many, many charities—never publicized—warrants well-deserved recognition for this man as a fine American.

—End—

IFT Convention

—Continued from page 85

At present, workers cleaning equipment often spill milk onto the floor and wash it down the drain.

But the utilization of all constituents of milk as human food is the industry's outstanding problem. Cheese should be developed which contains all milk constituents in the normal proportions. Utilization of milk concentrated to 50 percent solids offers some possibilities, as does the manufacture of ice cream from concentrated milk. And an ice cream which contains all constituents of milk would help the dairy industry—and would be nutritionally better.

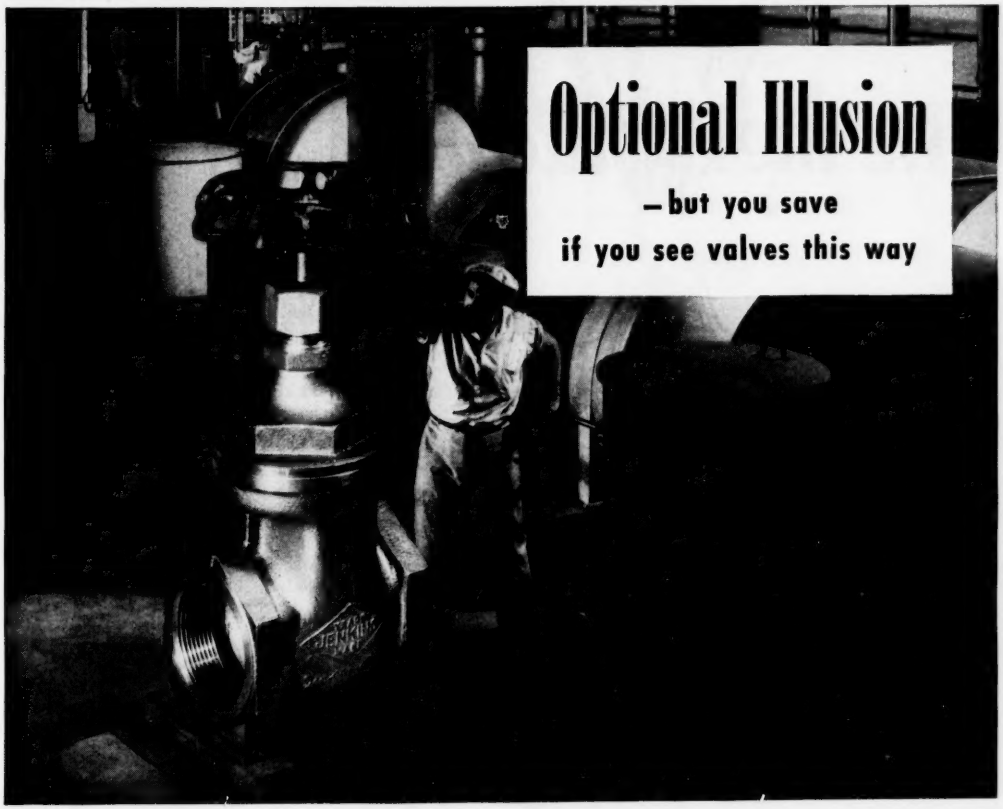
There is a need to reduce the high cost of distributing market milk, estimated to be a billion dollars a year. This might be achieved through improvement in evaporated milk and dry milk. Dry milk does not reconstitute properly. Spray drying gives a wide range of particle size, and the fat in whole dried milk greases-up the particles. In evaporated milk, the use of stabilizing salts should be permitted.

It should be possible to develop a continuous method of making processed Cheddar cheese, and special cheeses might be made in bulk to reduce labor costs.

Apples Improved by Syrup Treatment. Means of syrup-treating apple slices for freezing preservation, as carried out at Western Regional Research Laboratory, Albany, Calif., were described by D. G. Guadagni. The method was designed to prevent browning and to retain color and flavor.

It consists in removal of tissue gases by vacuum and replacing them by use of solutions of sucrose containing small amounts of antioxidants.

Success of the process depends on



Optional Illusion

—but you save if you see valves this way

THERE ARE TWO WAYS of regarding the valves in your plant. You can think of the relatively small cost of a single valve, and dismiss them as a minor, "petty cash" investment. Or, you can think of *all* valves in your plant as *one* valve, as pictured, by photo-magic, in this pharmaceutical plant,—and see them in proper perspective.

YOU'LL FIND IT PAYS to take the latter view, for in *any* plant, *any* building where fluid control is involved, valves, collectively, are as important, in terms of investment and operating expense, as larger plant units, and should be selected with the same sharp eye to quality and economy.

EXCESSIVE MAINTENANCE of one inferior valve is insignificant, but multiplied by thousands, it is a serious drain on operating budgets. JENKINS BROS. helps you meet this problem two ways. First, by building extra endurance into Jenkins Valves, making them the longest-lasting, lowest-upkeep valves that money can buy. Second, with advice from Jenkins Engineers on any question of proper selection, installation, or maintenance.

For all new installations, for all replacements, rely on Jenkins quality and engineering for lowest valve costs in the long run. *Sold through leading Industrial Distributors.*

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"PRACTICAL PIPING LAYOUTS" is a 32-page book containing diagrams and descriptions of 25 basic piping layouts with complete recommendations for valve selection and location in the lines. Tells you "which valve where for best performance". FREE on request. Write JENKINS BROS., 80 White Street, New York 13, N. Y.

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JENKINS VALVES

Types, Sizes, Pressures, Metals for Every Need

on merit alone!

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Without the help of advertising campaigns or promotional ballyhoo, the sales record of ALVA MAPLE has shown a persistent increase year after year from the time of its introduction over 30 years ago. This is a success story based on MERIT alone. ALVA MAPLE is preferred throughout all phases of the food industry by bakers, confectioners, ice cream makers, extract and syrup manufacturers—the armed services, too, ordered ALVA MAPLE in great quantities because of its outstanding goodness. A sample of ALVA MAPLE is ready for you — write for it — test and compare it *on merit alone.*

Alva

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315 FOURTH AVENUE, NEW YORK 10

maintaining vacuum. If this is done, an overall improvement results, particularly in the texture of soft varieties of apples. The "drip" or draining of liquid from the slices during defrosting is materially reduced by the vacuum-syruping method, and the flavor of the frozen product is termed far superior.

The amount of SO_2 required to prevent browning during defrosting is reduced by a third to a half of that required by usual sulphiting procedures.

A 40 to 60 percent syrup seems best; a 20 percent syrup results in a softer slice. Additional firmness can be secured by adding calcium salts to the impregnating syrup.

Pickles and Pickled Products. The leaders of this discussion pointed out the basic methods in the pickling cycle and various developments in recent years. The salinity of the first brine, used in pickling, is of prime importance to the ultimate product, observed Dr. I. D. Jones. He pointed out that chemical changes in the product begin immediately, and hence control of the salt content must be given careful attention.

Recent experiments in de-salting indicate that pickles should be freshened within 24 hrs., Dr. F. W. Fabian told the group. He observed that 95 percent of the salt is removed in the first 8-hr. bath, and that subsequent baths remove a like percentage. The alkalinity of water in different parts of the country can greatly alter the effectiveness of alum in the final finishing process, he continued, and the aluminum element is often precipitated out as aluminum hydroxide.

Experiences with new equipment, which utilizes stainless steel needles for piercing the cucumber, were discussed, relative to the elimination of "bloaters".

Action of Enzymes in Onion Powder. Flavor formation in dehydrated garlic and onion is an enzymic reaction, according to R. M. Stephenson, chief chemist, Basic Vegetable Products, Inc., Vacaville, Calif.

Powders cannot be successfully spray dried because in that process all cells are ruptured and flavors destroyed. And onions and garlic cannot be sulphited or blanched, because these methods destroy flavor-giving enzymes. Control of microorganisms depends on plant sanitation and on natural antibiotics in the material.

After drying onion or garlic, enzymic action stops, so no odor or flavor is apparent. But as soon as the product becomes moist, enzymic action develops flavor.

Rehydration of dried onion slices

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● Smooth operation and freedom from mechanical troubles are assured with NORTON OSLUND Labelers by simple design, fine workmanship, heavily constructed parts, bronze bushed bearings, and hardened steel cams.

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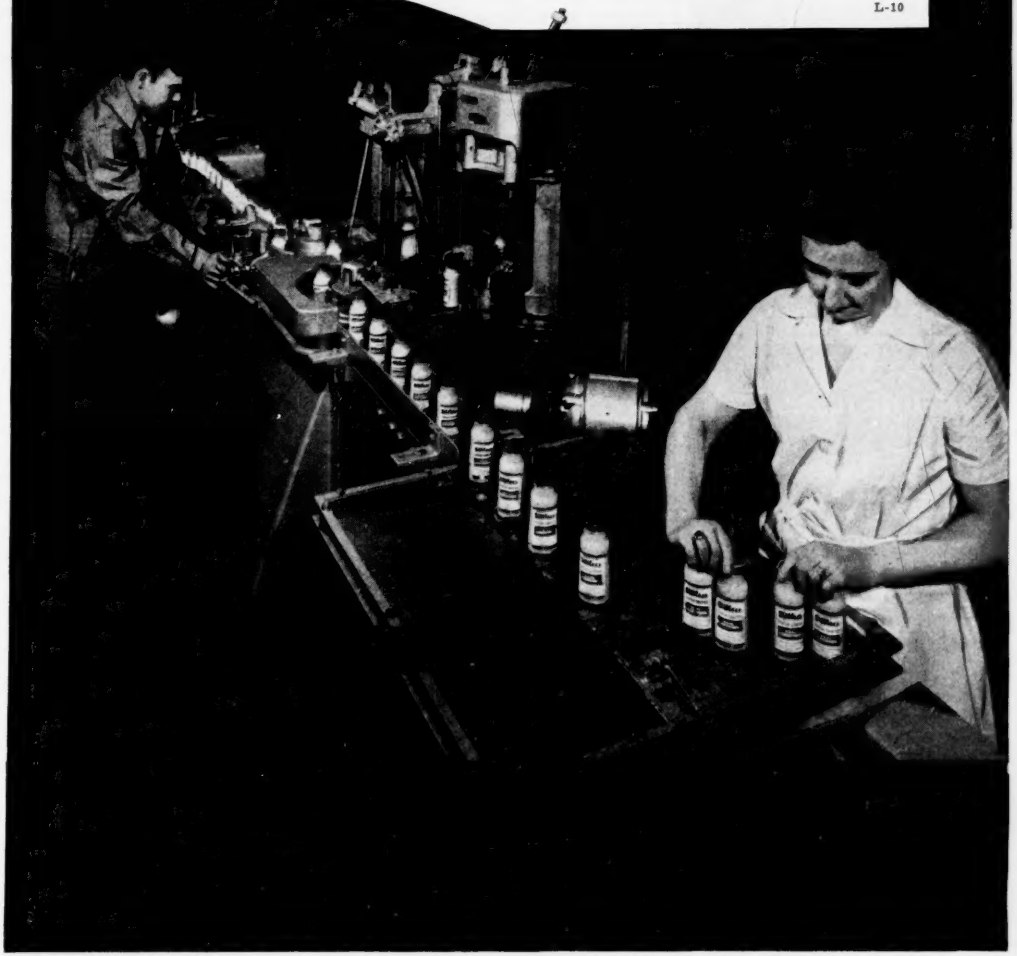
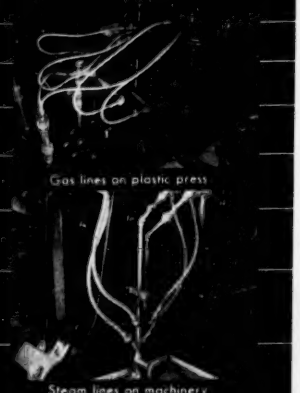


WHEN THE *Pressure* IS ON . . .



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If your operation requires moving gases or liquids under pressure, chances are Titeflex can increase your efficiency and lower your costs. Titeflex is made in five metals, to solve problems of heat and corrosion as well as pressure. It's made in a complete range of sizes, and it lasts longer because it's *all-metal*. It remains flexible even when under pressure, with no danger of leakage. Write us for complete catalog describing Titeflex advantages in full.

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must be conducted in a medium of the correct pH—water is best. The onion cannot be rehydrated in vinegar because the high acid content prevents enzymic action.

Vitamin Retention In Processed Beans. Dr. Agnes Fay Morgan, U. of California, Berkeley, reported findings on vitamin retention in raw, cooked, dehydrated and canned dry beans. Five kinds of beans were used: Small navy, baby lima, soya, red kidney, and garbanza (chick pea).

Thiamin analysis indicated that raw navy and red kidney beans had originally about 0.8 mg. per 100 g., the others 0.4 to 0.6 mg. per 100 g. of raw beans. Loss in cooking was about 50 percent, while there was very little lost in dehydration, and little or none lost in canning.

Riboflavin varied between 0.2 and 0.4 mg. per 100 g. of the raw beans and 20 to 80 percent of it was lost in dehydration and canning. It appeared to be increased in the cooked navy and lima beans.

Niacin assays showed 1.4 to 2.7 mg. per 100 g. of raw beans. Of this, 15 to 50 percent was lost in dehydration, 40 to 65 percent in canning. Canned soybeans, however, retained nearly all the niacin.

Iron and calcium were little affected by the precooking and dehydration.

Dry beans may be successfully cooked and dehydrated with about as good retention of vitamins in storage as is shown by raw or canned beans.

Beans have anti-metabolism and anti-enzyme factors. Even after processing, a factor remains that slows up digestion of both starch and protein. Thorough cooking is needed to rid beans of anti-enzymes.

Starch Coating Improves Dehydrated Carrot. Starch coating of dehydrated carrots, a process originated by the Western Regional Research Laboratory, Albany, Calif., was discussed by M. P. Masure.

Treated in this way, carrots showed relatively great stability at all stages of storage. Carotene content, color retention, and organoleptic quality were good. Starch-sprayed carrots showed no tendency to stick together.

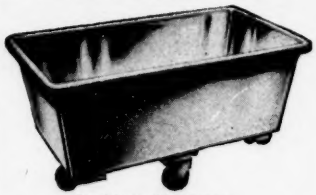
Peroxidase Inactivation Improves Frozen Asparagus Flavor. W. V. Cruess, U. of California, noted that peroxidase, if not destroyed by blanching, gives a stale and hay-like flavor to asparagus.

Peroxidase is killed in 15 min. at 71 deg. C. It survives 100 deg. C. for 5 min., but is killed in 10 min. These times and temperatures indi-

STANcase
STAINLESS STEEL
EQUIPMENT

The three units of STANcase Stainless Steel Equipment illustrated below have wide application in all types of food handling plants. *ECONOMY* dictates their adoption for all operations which entail sanitary control, corrosion hazards and where it is necessary to protect quality and flavor of products.

The units illustrated are standard STANcase items which we manufacture to highest quality-specifications with *production-line economy*. Write for descriptive literature.



STAINLESS STEEL
FOOD HANDLING TRUCK No. 18

Ruggedly constructed of 14 gauge, sanitary Stainless Steel.
Inside dimensions: 43½" x 22¼" 16" deep.
Also available in other sizes.
Seamless construction; all corners are generously rounded; maintained clean and sanitary with minimum labor.

STAINLESS STEEL TUB

Constructed entirely of sanitary, Stainless Steel.
Inside dimensions: Diam. Top 19"—Bottom 16"—Depth 13¾".
Inside surfaces highly polished and seamless. Maintained clean and sanitary with minimum labor.

STAINLESS STEEL TABLES

Top, back and sides 14 gauge, sanitary Stainless Steel.
Standard lengths: 8 ft., 10 ft., 12 ft.
Table Tops with cutting board extensions: from 30" to 42".
Table heights adjustable from 32" to 36".

Fully Approved by Health Authorities

MANUFACTURED BY

THE STANDARD CASING Co., Inc.

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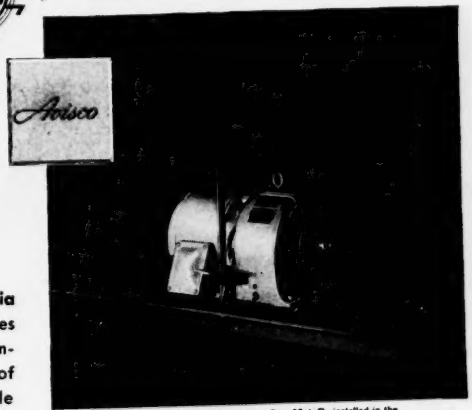
2 MORE Nationally Known Firms

WHO USE THE Philadelphia GEARMOTOR

Above: Showing one of four 3 H.P. Philadelphia GearMotoRs recently installed by the R. M. Hollingshead Corp., Camden, N. J. Motor speed—1750 R.P.M.; output speed—350 R.P.M.; Reduction ratio is 5:1. Driving a square can seamer.

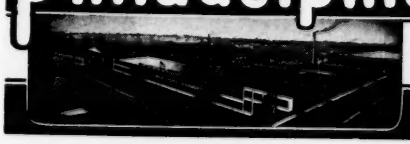


Above: Showing one of two 1 H.P. Philadelphia GearMotoRs installed in the Front Royal Plant of American Viscose Corp. Motor Speed—1750 R.P.M.; output speed—125 R.P.M.; Reduction ratio is 15:1.

Here are some of the reasons why the **Philadelphia GearMotoR** is being used by hundreds of companies throughout industry: It is a self-contained, extremely compact unit that conforms to recommended standards of A.G.M.A. and N.E.M.A.; it is available in single, double and triple reductions . . . and the range of speeds run from 780 through 7.5 R.P.M.; motor rating from 1 H.P. through 60 H.P. . . . A-c or D-c. Motors are precision-built and fit perfectly with gear unit. Gears are of the helical type, long-lived and quiet in operation; made of quality alloy steel, precision machined (teeth shaved) and induction-hardened. Assembly is very simple: Motor and gear units are each self-contained, yet readily separated; gears in multi-reduction units may be inspected without uncoupling from driven machine. Lubrication is of the positive "splash type," with large reservoir. Gear housing is leak-proof, and motor, which is greased independently, has double-shielded ball bearing design.

Send for 42-page illustrated catalog, containing full information and data necessary for ordering, and please use your Business Letterhead when requesting same.

Philadelphia Gear Works, INC.



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Synchronized BOTTLING *Line*
— SEE IT IN ACTION —

Always gives a constant maximum in your daily production! The bottles are automatically spaced on entering the "BOTTOMS UP" Cleaner and then maintain their distance as they travel through all machines.

HIGH SPEED
BREAKAGE IS MINIMAL
NOISE REDUCED UP TO 75%
EMPLOYEE-FATIGUE GREATLY LOWERED

A Synchronizing transmission drive powers the Line as one unit:

"BOTTOMS UP" CLEANER
ROTARY VACUUM FILLER
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with the through
CHAIN BELT CONVEYOR

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NEW YORK—BOSTON—CHICAGO—BALTIMORE—SAN FRANCISCO—SEATTLE—LOS ANGELES—SAVANNAH—LONDON, ENGLAND

eate the amount of blanching necessary for successful storage of frozen asparagus.

Reduction of Spoilage of Fresh Fruits and Vegetables. Dean E. Pryor, Wallace & Tiernan Sales Corp., Monrovia, Calif., reported on the necessity of reducing spoilage of fresh fruits and vegetables.

Carbon dioxide, sulphur dioxide, ozone, and nitrogen trichloride have been found useful in the storage and shipment of specific fruits and vegetables. Wraps treated with pine oil or with diphenyl have been used on apples and citrus fruits with marked success.

Washes used to reduce spoilage include soda ash, borax, hot water, sulphur compounds, phenolics, hypochlorite, hypochlorous acid, copper sulphate, potassium permanganate, quaternary ammonium compounds, and formaldehyde.

Chemically treated ices, not widely used, contain chloramine-T, benzoic acid, quaternary ammonium compounds, or aldehydes.

Waxes are of little commercial importance, though they have been extensively employed to improve appearance and prevent moisture loss in fresh fruits and vegetables.

—*End*

CASE HISTORY #3

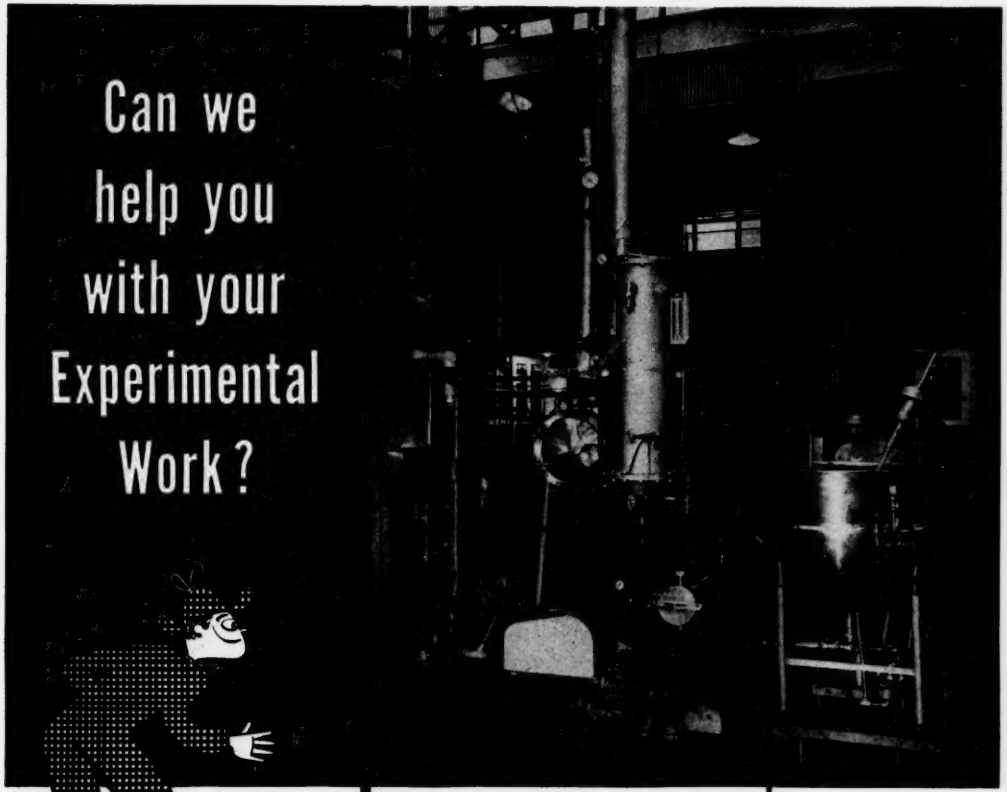
The ..... Co., National Distributors of imported food products, desired consumer packaging for one of their bulk imports.
Plant conditions had to meet most stringent standards for cleanliness and supervision:
The product required humidity control for proper handling.

Edlaw was contacted — a trial run was arranged —and a permanent line has been in production for the past year.
Customer has renewed contract for the year 1949.

Memo to
Contact
The Edlaw Co.

Contract Packaging
AT PRE-DETERMINED COST
88-61 76th AVENUE
GLENDALE, L. I., N. Y.

Can we help you with your Experimental Work?



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The new BUFLOVAK Low-Temperature Evaporator, operating at temperatures as low as 58° F. and at safe pressures, brings improved results to a wide range of delicate liquids.

A complete line of BUFLOVAK Equipment for processing chemicals and foods, including Dryers, Solvent Recovery Equipment, and Processing Equipment, is available to complete your process on a pilot plant scale.

Full information on request.

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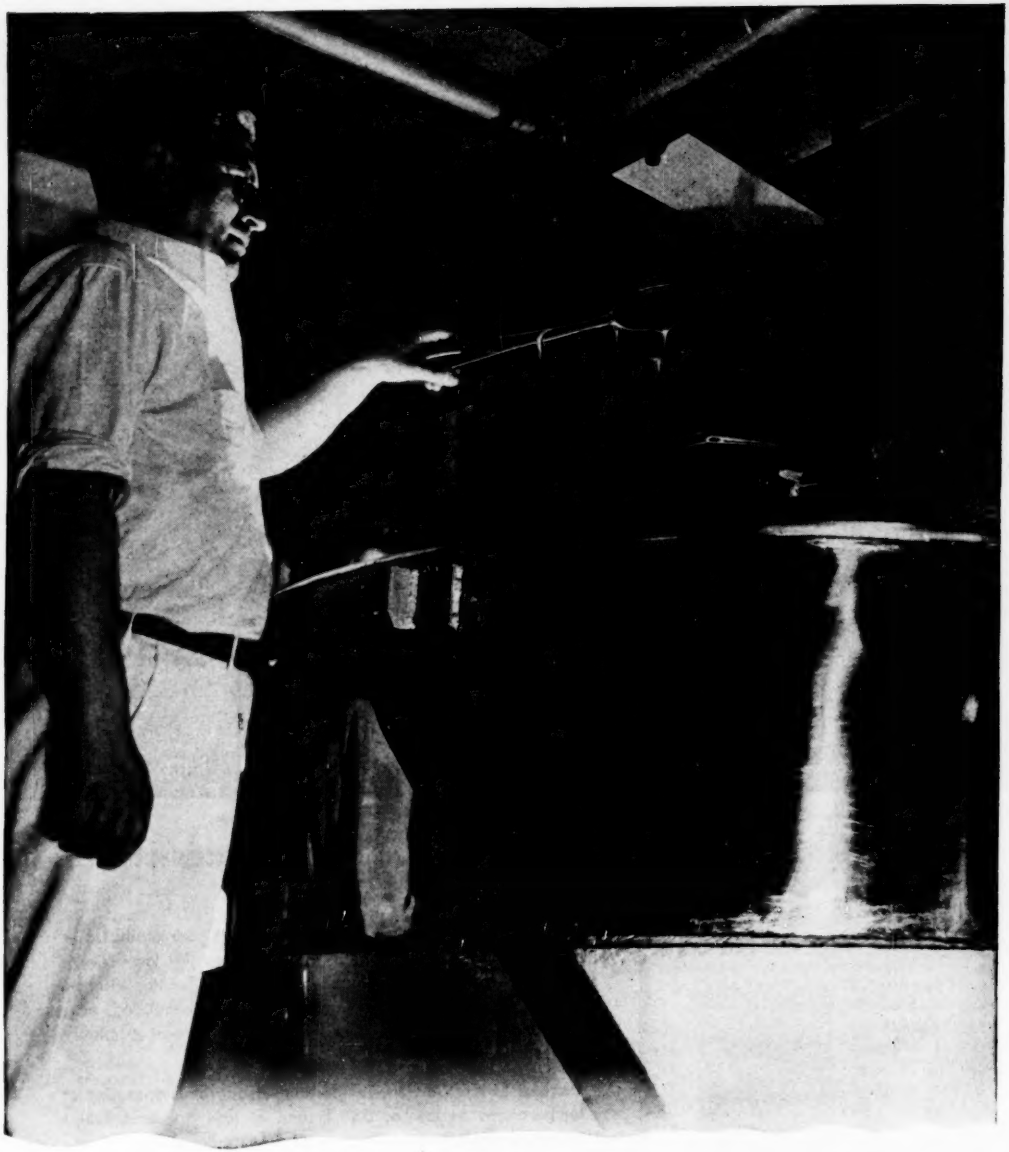

Enduro

REG. U. S. PAT. OFF.

REPUBLIC STEEL

STEAM-JACKETED KETTLES OF ENDURO STAINLESS STEEL help to assure "original" taste, flavor and purity of processed food products at the dining table. Other ENDURO applications include sorting tables, sinks, hoppers, mixing tanks, pails, utensils, sanitary piping, valves and fittings—practically every type of processing, packing, packaging and distribution equipment used throughout all phases of the food industry.

...AND NOW FOR LOWER MAINTENANCE COSTS

Equipment made of Republic ENDURO Stainless Steel offers many maintenance advantages. Faster, easier cleaning . . . fewer production interruptions . . . substantially lengthened equipment life . . . all result from the adoption of stainless steel for food processing equipment.

ENDURO is not an ordinary metal. It is unusually strong and tough—highly resistant to wear, rough usage and abuse. It is as inherently clean and easy to keep clean as glass. Like glass, too, it is unaffected by food products and has no effect upon them. These qualities, plus the fact that it never needs refinishing or resurfacing, make ENDURO a match for the most exacting food requirements.

There are many ENDURO analyses, each designed to meet specific application needs. Talk with your equipment manufacturer or write for more information.

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Alloy Steel Division • Massillon, Ohio
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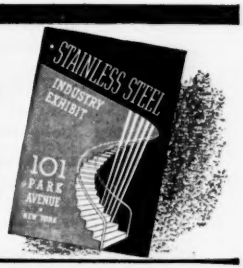
STAINLESS STEEL

✓ Check ALL 10 Advantages: • RUST AND CORROSION-RESISTANCE • HEAT-RESISTANCE • HIGH STRENGTH • EYE APPEAL • NO METALLIC CONTAMINATION • SANITARY SURFACES • EASY TO CLEAN • EASY TO FABRICATE • LONG LIFE • LOW COST



VIRTUALLY UNBREAKABLE!
So strong that the pH-sensitive bulb can withstand as much pressure as the thick stem itself!
Abrasion resistant—unusually rugged for long life and reliable measurement even in highly abrasive slurries!
Chemical durability—excellent in the strongest acids and alkalis . . . even at elevated temperatures!
COVER EXTREME TEMPERATURES!
30° to 130° C at high pH—with the new high temperature—high pH glass.
—20° to 100° C—with the new general-purpose glass. Will withstand even repeated freezing.
Now- NEW BECKMAN pH Electrodes
UNPRECEDENTED pH RANGE!
0 to 14 pH—with the high-temperature high-pH glass . . . only small reproducible deviation near extreme limits, even at high temperatures.
0 to 11 pH—at room temperature and 0 to 10 pH at boiling for the general-purpose glass . . . without correction for sodium ions!
IMPROVED CONSTRUCTION!
Simplified, heat-resistant construction eliminates wax filling . . . retains patented Beckman internal shielding . . . increases measurement precision.

Only *Beckman Glass Electrodes* offer all of these features:

▸ **RAPID RESPONSE** . . . accuracy with speed and convenience.

▸ **STABILITY** . . . to match the high precision of BECKMAN pH METERS.

▸ **INTERNAL SHIELDING** . . . gives complete freedom from outside electrostatic interference.

▸ **INTEGRAL LEADS** . . . Continuous insulation into the electrode . . . connections located on protected panel board.

▸ **EXTREME TEMPERATURE RANGE** . . . Several types permit use from below freezing to boiling *and above!*

▸ **ENTIRE pH SCALE** . . . *Very small* sodium ion errors . . . e.g., with high-temperature high-pH glass, only 0.2 pH deviation at 13.7 pH in 1 N sodium hydroxide.

▸ **FACTORY SEALED** . . . rigidly tested . . . no maintenance.

▸ **UNIQUE CHEMICAL DURABILITY** . . . in alkali . . . in acid . . . in dilute solutions.

And . . . *REALLY TOUGH* . . . can even be used as a stirring rod!

These new electrode glasses are now being used in several Beckman electrode styles. As rapidly as possible, they will be available in the full line of Beckman Glass Electrodes.

Constant Research over the years has maintained Beckman Leadership in the instrumentation field . . .
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1. SUPER-FRICTION CLUTCHES. Large frictional areas. "*Job-Rated*" for smooth action and long life.

2. RUGGED 3-, 4- or 5-SPEED SYNCHRO-SHIFT TRANSMISSIONS — "*Job-Rated*" for the load. Carburized gears; heat-treated shafts; antifriction bearings throughout.

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6. SAFETY-LOCATED GAS TANKS . . . Outside the cab, NOT inside!

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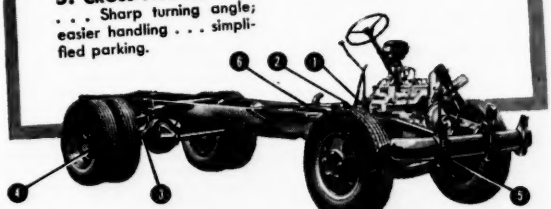
NEW STEERING COLUMN GEARSHIFT . . . Standard equipment on ½-, ¾- and 1-ton models with 3-speed transmissions . . . provides easier handling, more unobstructed floor space, greater safety of operation.

"RIGHT-SPOT" HAND BRAKE . . . under the center of the cowl . . . *right where you want it.* Standard on all ½-, ¾- and 1-ton models. Provides unobstructed floor space; easier passage through either cab door.



THEY'RE more-for-your-money any way you look at them!

Read why . . . on this page. *See* why . . . at your Dodge dealer's.

New B-2 Series Dodge "*Job-Rated*" trucks are designed throughout to last longer . . . to save you money!

Compare them—feature for feature, price for price, value for value—with any other trucks! Know what you're getting for what you pay.

Switch to Dodge. See your Dodge dealer . . . now . . . and *save money!*

NEW Dodge B-2 Series Engine Features

- **FAMOUS DODGE L-HEAD TRUCK ENGINES** . . . "Job-Rated" for your loads. Save gas, oil—cut service expense.
- **COMPLETELY SPLASH- AND DUST-PROOF ELECTRICAL SYSTEM** . . . with high-output generator. Resistor-type spark plugs, and high-output coil, provide amazingly smooth engine operation; insure longer plug life.
- **EXHAUST VALVE SEAT INSERTS** . . . resist wear, pitting. Reduce valve grinding; preserve performance.
- **REPLACEABLE PREFITTED MAIN BEARINGS** . . . precision, long-life quality. Reduce maintenance costs.
- **FULL-LENGTH CYLINDER COOLING** . . . uniform cooling of cylinders, protects . . . reduces wear.
- **4-RING ALUMINUM ALLOY PISTONS** . . . for top performance; longer bearing life; low oil consumption.
- **FULL-PRESSURE LUBRICATION** . . . positive pressure to main, connecting rod and camshaft bearings and camshaft drive; prolongs engine life.
- **OIL-BATH AIR CLEANER** . . . highly effective in protecting the engine from dust and dirt.

356 BASIC CHASSIS MODELS, RANGING FROM 4,250 TO 23,000 LBS., G. V. W. . . . PRICED WITH THE LOWEST

How Fruit Pressers Save Pressing Time . . . increase juice yields with CELITE Pressing Aids

Here is an easy, low-cost way to increase your juice yields, cut down pressing time and save wear and tear on your equipment.

Simply add a small amount of a Celite Pressing Aid to the pulp before pressing.

It works like this:

Celite Pressing Aids are diatomaceous silica powders. The tiny Celite particles, open and porous in structure, interpose themselves between the particles of solid pulp matter, opening up countless channels through which the juice escapes—freely and at lower pressure. More juice is thus extracted in less time. Press slippage is also eliminated, the drier cake is more easily removed and the cloths may often be replaced without the need for washing.

Photomicrograph showing a few of the many varied shapes which make up a Celite Pressing Aid. These minute particles form countless channels for the juice to escape.

Celite Pressing Aids are being successfully used in the pressing of practically all types of fruit products. They require no special equipment. And the saving in pressing time, together with the increase in juice yield and the saving on cloths and other equipment which results from their use generally more than pays for the cost of the small amount of Pressing Aid required.

For further information on Celite Pressing Aids, write Johns-Manville, Box 290, New York 16, N. Y.

WHAT USERS FIND

$3 Bag of Celite Pressing Aid Returns $57.40 Profit

(reported by J-M Engineer H. G. Martin)

Recently, one of my customers asked if we could increase his grape pressing yield.

I added one pound of a Celite Pressing Aid (about ½% by weight of grapes) and stirred it throughout the mass. The mixture was then placed in cheese racks under the hydraulic press.

Previously, the pressing operation had taken 16 minutes. With Celite, the press closed completely, producing a dry cake in nine minutes. Instead of requiring a total pressure of 1100 lbs. psi the press was finished at 600 lbs. psi. There was no slippage of the frames, the cloths cleaned better, and there was no breakage of cloths. In addition to this, the final yield of juice was so much greater that each $3.00 bag of Celite used resulted in an overall profit of $57.40.

One Hydraulic Press Load Convinces Jelly Maker

(reported by J-M Engineer T. A. Feuss)

When I attempted to sell a Celite Pressing Aid to this jelly manufacturer, the thought of putting a filter powder in his fruit to get more juice quicker seemed ridiculous to him.

However, a run was made, adding 1½% Celite to the guavas at the cookers. Observers remarked that they had never seen the press close so rapidly or so far. On emptying the press, the cheeses were quite dry and one laborer could remove them from the cloths because they sheared off by gravity. No cloths or lattices were broken, the juice was noticeably free from suspended mud and the cloths were replaced in the press without washing.

Sales Appeal Improved with Celite

(reported by J-M Engineer W. A. Reschke)

A trial run convinced this customer that he had much to gain by using Celite Pressing Aids in making jelly from frozen grapes.

The equipment used was a vertical hydraulic press. Without Celite, the centrifuges had to be cleaned 3 times a day. With Celite, they required cleaning only once a day. The customer also noted that the cloths were in better condition after pressing with Celite. Production of juice remained about the same, but the jelly was much clearer—it had better sales appeal—and judging from its appearance, a considerably longer storage life could be expected.

These advantages were obtained by the addition of 20 pounds of Celite to each 900-lb. batch of grapes pressed.

Celite Makes Apple Pressing Easier

(reported by J-M Engineer F. D. Richards)

During my first call on this customer, I recommended the use of 2% of a Celite Pressing Aid in their apple pulper.

Recently, when I called again, he informed me of the results. Ordinarily, with the kind of apple they are using at present, the press cake is squashy and slippery. With Celite, the cake is much firmer and they are able to operate the press at a higher pressure. This, according to their estimate, has increased the juice yield by approximately 5%.

Johns-Manville JM PRODUCTS

Celite Pressing Aids

Reg. U. S. Pat. Off.

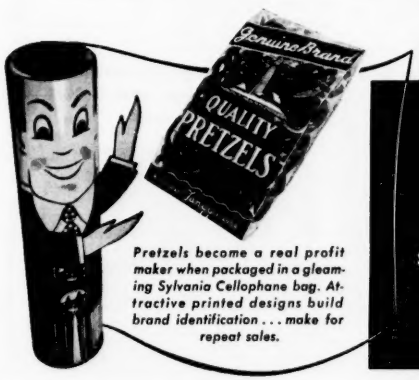
CELLOPHANE gives you all this in one package

Name your packaging requirements! Whatever your product calls for, there is a Sylvania Cellophane to give it the utmost in protection and gleaming beauty that means sales.

For example take Sylvania Cellophane in one of the MS types. Because they are truly transparent, they give your product extra visibility . . . let it sell itself. They resist grease . . . keep foods from drying out and free from contamination. Their uniform strength and heat sealing qualities make them easy to apply either by hand or automatic equipment.

Talk over your packaging problems with the Sylvania representative. He'll be glad to help you determine the combination of properties needed for your products. Or write to Market Development, Dept. F-10, for information, mentioning the specific application in which you are interested.

You'll find us most cooperative.



Pretzels become a real profit maker when packaged in a gleaming Sylvania Cellophane bag. Attractive printed designs build brand identification . . . make for repeat sales.

SYLVANIA CELLOPHANE

SYLVANIA CELLOPHANE

SYLVANIA DIVISION AMERICAN VISCOSE CORPORATION

Manufacturers of cellophane and other cellulose products since 1929

General Sales Office 350 Fifth Avenue, New York 1, N. Y.

Plant Fredericksburg, Va.

Food Handling News

Sandvik Steel, Inc.—Manufacturers of Steel-Belt Conveyors For Over 30 Years

Sandvik steel-belt conveying tables in use on beef boning operation.

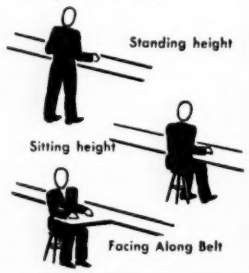
SANDVIK STEEL-BAND CONVEYING WORK TABLES IMPROVE MASS FOOD PROCESSING

Moving Table Top of Type 302 or 316 Stainless Steel Offers Many Cost Cutting Advantages For Processing And Inspection Of Meat, Fish, Candy, Bakery Goods, etc.

Sandvik stainless steel conveying work table with adjustable sides.

Conveyors Arranged To Fit The Operation

Sandvik steel-belt conveying tables can be arranged to suit whatever worker position is called for.



Sandvik has incorporated a flat, unbroken strip of stainless or carbon steel into a work table arrangement adapted to the specific operation. The basic design is flexible and can be fitted to virtually any food handling need.

Some of the ADVANTAGES

Easy to Keep Clean—Live steam or boiling water can be applied directly.

Smooth Impermeable Surface—No place for food particles to lodge.

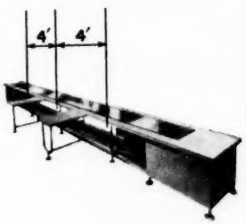
Long Service Life—Sandvik steel belt has inherent high strength and resistance to time and wear.

Engineered To Fit Application—Lengths to meet any center distance. Standard work table belt widths are 20" and 12" but special widths are also available. Correct working height of belt from floor can be arranged despite special floor conditions. Painted framework is standard but can be galvanize dipped when required.

SECTIONALIZED DESIGN OF SANDVIK CONVEYING TABLES COMBINES STANDARDIZATION WITH ADAPTABILITY

Sandvik steel-belt conveying work tables are constructed with standardized intermediate sections. The supporting structure and stationary table surface between the two pulley mountings is made up of standard four foot sections.

Any conveyor length in multiples of four feet is available. The sectionalized design simplifies assembly and reduces construction costs without impairing flexibility or adaptability.

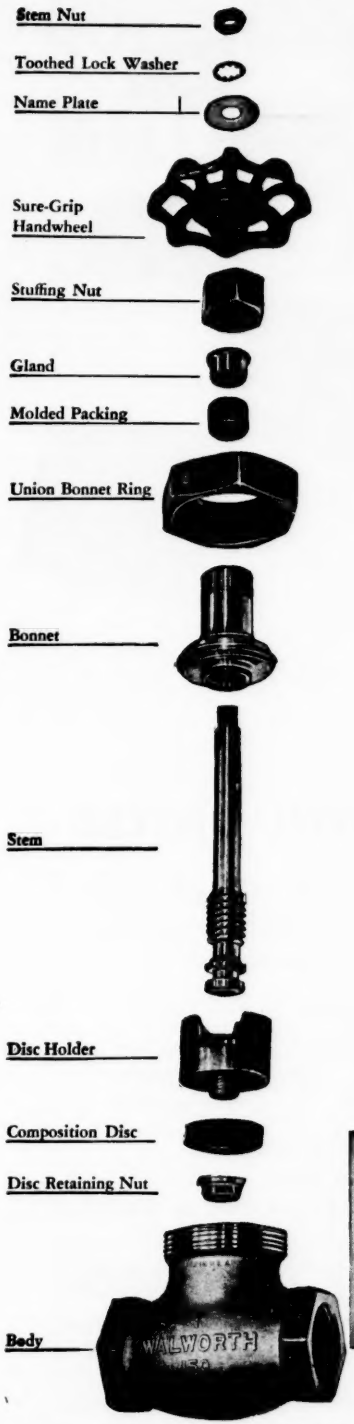


Sandvik conveying work table with two, four-foot intermediate sections.

For complete information on Sandvik steel-belt food handling tables and conveyors write:

SANDVIK STEEL, INC.
Conveyor Department
111 EIGHTH AVE., NEW YORK 11, N. Y.
WAtkins 9-7180

SANDVIK STEEL BELT CONVEYORS



TO MAKE A GOOD VALVE BETTER

Walworth has redesigned and improved its No. 95 Quality Bronze Globe Valve.

150 pounds working steam pressure at 500F

300 pounds cold water, oil, or gas.

Can be repacked under pressure when fully opened.

The Walworth No. 95 Bronze Globe Valve has always been tops with piping men because they liked these features: Renewable composition disc; lock-on, slip-off disc holder; union bonnet construction; deep stuffing box; tough bronze body made of Composition M (ASTM B61).

Now Walworth has added these improvements: (1) New cylindrical disc holder that accurately guides the disc to the seat, regardless of the position in which you install the valve. (2) Newly designed, air-cooled, sure-grip handwheel that you can grab and turn, even when wearing greasy work gloves. It has a tapered square hole sized to gage to fit snugly on the finished square of the stem. (3) Toothed lock-washer to prevent the stem nut from becoming loose. (4) All parts have been redesigned to give maximum service and strength.

Walworth Quality Bronze Valves are available in Globe (No. 95), Angle (No. 96), or Check (No. 97) types and in sizes from ¼ to 3 inches (check valves ¼ to 2 inches). Ask your Walworth distributor to show you the improved Walworth No. 95 Bronze Valve, or write for further details.

WALWORTH

valves and fittings

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UNITED'S packages give your product protection against crushing. Guarantee freshness, quicker, safer—they speed sales.

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*handy to use	give longer protection
*more durable	resist crushing
*sales-boosters	get customers

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CORK INSULATION SAFEGUARDS MILLIONS IN FOOD STORAGE DURING POWER FAILURE.....

> perishables—was entirely without power.
> Half a foot of cork insulation would keep temperatures low for several days, it was said.
>
> *Newspaper clipping*

The emergency came suddenly in a teeming metropolitan area. Power failed while the city wilted in record heat. Perishables in storage, worth millions of dollars, were threatened with spoilage . . . and then someone remembered that the cold storage warehouses affected by the power 'black-out' had cork insulation. The public was assured that this would keep temperatures low despite the heat blight; perishables would be safe for several days.

The incident serves to show how important is the *reassuring dependability* of cork insulation. This widespread confidence in cork comes from tested and proved performance . . . from the record of service over many years.

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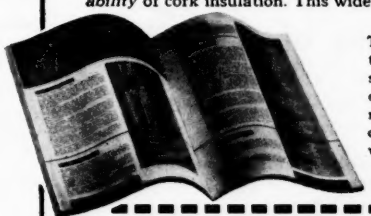
In Mundet Corkboard you get cork at its best . . . processed to insure longest, most efficient insulating service. Whether you have small or large facilities for low temperature it pays to specify Mundet Corkboard.



The best insulation requires competent installation. You benefit from the experienced erecting services that are offered by Mundet branch offices. Corkboard is available for prompt shipment from nearby warehouses. Send coupon for copy of Mundet Cork Manual. Prepared in convenient filing size, with cork specification data.

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427 West 4th Street
DALLAS 1
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KANSAS CITY 7, MO.
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(Maywood)
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315-25 N. Front Street
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856 N. 48th Street
ST. LOUIS 4
2415 South Third Street
SAN FRANCISCO 7
440 Brannan Street

In Canada:
Mundet Cork & Insulation, Ltd.
35 Booth Avenue, Toronto

Write us for name of our nearest representative if there is no Mundet office in your city.

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CORK INSULATION

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Insulation Division
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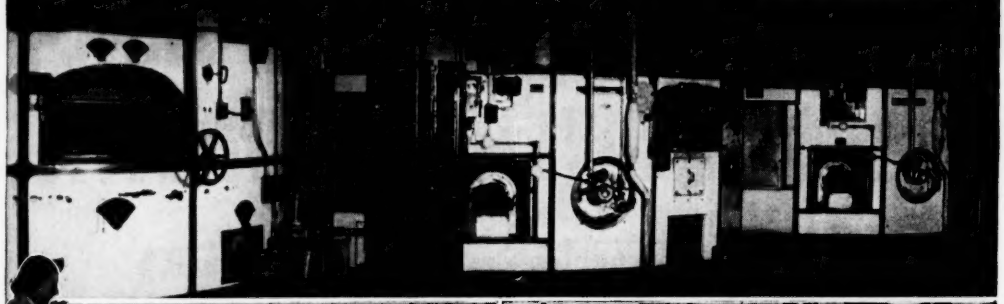
FOOD PROCESSING



Gas-fired revolving tray ovens used for specialty baking.

Gas-fired cooker assures the absolutely uniform temperatures required for English muffins.

Immersion tank units used for blanching nuts are typical of the GAS units at work in this far-flung operation.

Exterior of Plant, 100 Oakman Blvd., Detroit 3, Mich.

Specialized Production Methods at

FRED SANDERS - DETROIT

Emphasizes Versatility of GAS

MADE-TO-ORDER baked goods and confections prepared by productioneering methods—that's the success formula of Fred Sanders. Wherever a manufacturing operation can be streamlined, modern machinery takes over the task. And, wherever heat is required for cooking or baking, GAS and efficient Gas Equipment are fitted right into the production system.

Versatile GAS performs a variety of operations for this Detroit food manufacturer—

VARIETY BAKING—thousands of cakes, pies, coffee cakes, and cookies, of all varieties.

GRIDDLES—griddle cooking of English muffins at precisely 315 degrees.

MELTING—batch-melting of ingredients for 25,000 to 30,000 pounds of assorted candies daily.

BLANCHING—deep-fat blanching of nuts for toppings.

COOKING—processing of fruits and syrups, for confectionary, and finishing candy and baked goods.

BREAD OVENS—continuous travelling tray ovens keep pace with retail shops and sandwich service demands.

In each of these product groups the temperature requirements vary widely and automatically controllable GAS is essential to uniformity and finish. Modern Gas Equipment, with its high productive capacity and operating flexibility, fits perfectly into the Fred Sanders streamlining program. In addition, cleanliness of GAS and simplicity of equipment facilitate plant housekeeping and sanitation.

Wherever heat is required in food processing there's a task which GAS can do to perfection. Your Gas Company Representative has some valuable information for you—call him soon.

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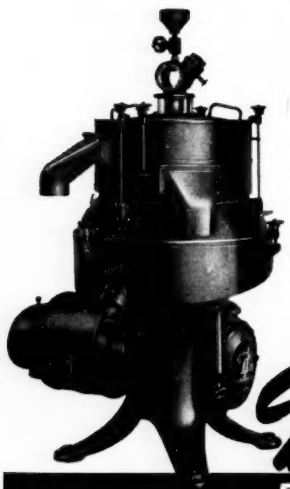
"In some food plants speed is all-essential. In some, added clarity of product is more important than anything else. It depends, of course, on the application."

● **Which Can I Do For You?**



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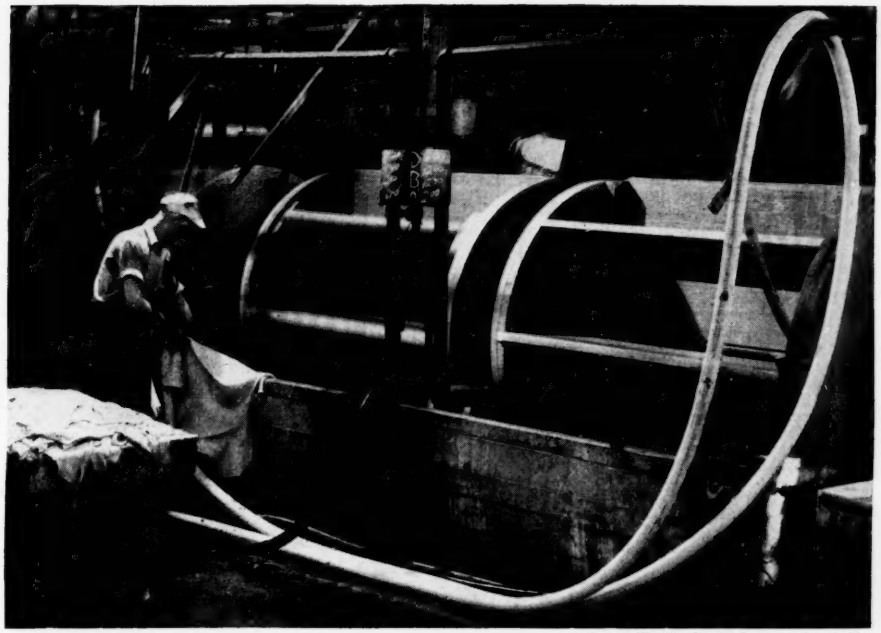
SEPARATION · CLARIFICATION · CONCENTRATION



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. . . Republic Hose is used in every industry

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Dryers, Fan Type	B	C
Drying Tumblers	B	A
Water Heaters	B	C
Preheaters, Fuel Oil	B	C
Rotating Cylinders	B	B
Slashers	B	B
Dry Cans	B	B
Flat Work Ironers	C	B
Presses, Laundry	C	A
Stocking Forms	C	A
Presses, Plastics	C	A
Presses, Platen	C	A
Evaporators	B	C
Steam Lines Outdoors, small	A	D

*Ask for Technical Bulletin No. 2

A THERMOSTATIC

Wide open when cold for quick starts. Retains more of the heat before releasing condensate. Large valve orifice purges air quickly when starting. No seat changes when pressures change. Cannot freeze. Bulletin No. 250.

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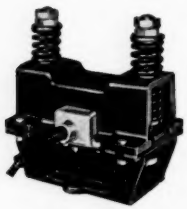

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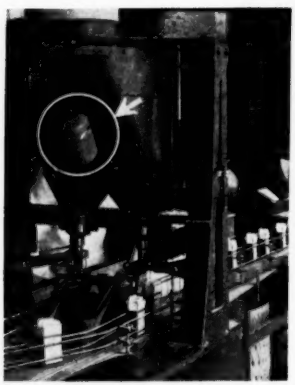

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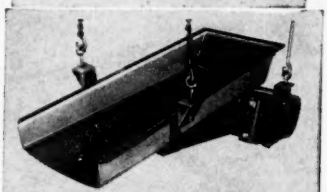

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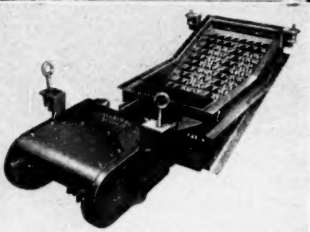

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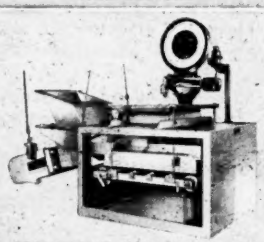

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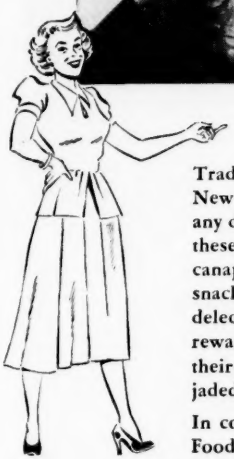
"HIGH INTENSITY"

Good luck any day of the year...



Tradition has it that eating herring on New Year's Eve brings good luck. But any day is your lucky day when you have these Vita Brand herring delicacies for canapes, with dinner or as a late evening snack. The taste thrill you get from these delectable herring fillets and snacks is a reward in itself. They have a flavor all their own. Just the thing to perk up jaded appetites.

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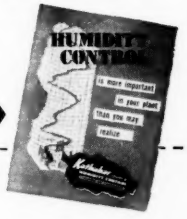

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. . . of Buying Information

Mr. E. R. Warner, shown above, is responsible for specifying, buying or otherwise influencing the purchase of food processing machinery, equipment and supplies for the Pennsylvania Frosted Foods Corp., Southhampton, Pennsylvania.

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Mr. Warner says of FOOD INDUSTRIES CATALOGS: "A very valuable volume of information."

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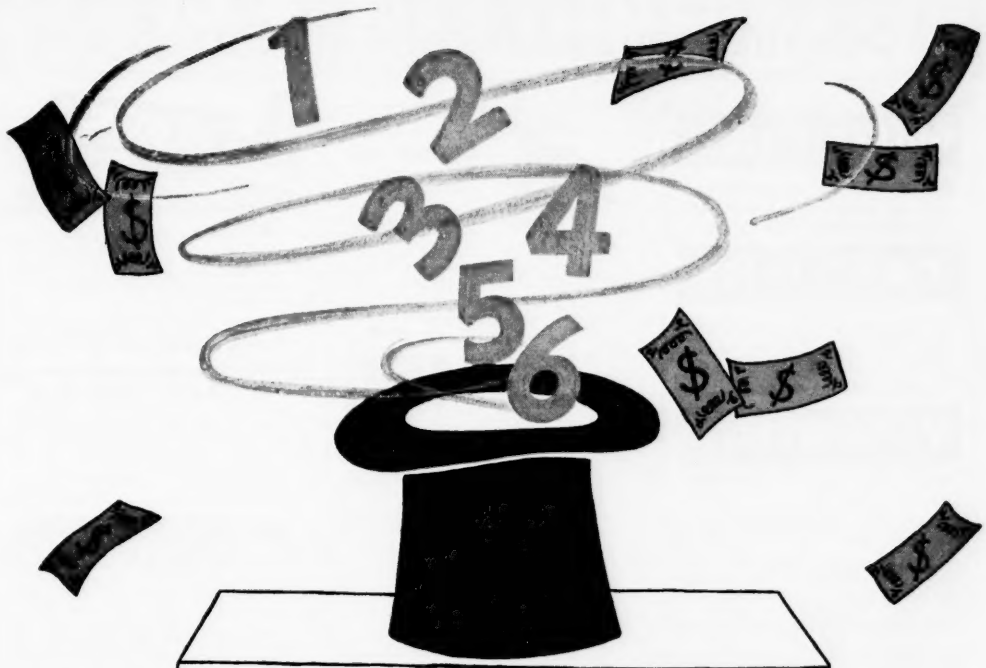

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CROSSE & BLACKWELL CUT COSTS

with Taylor Automatic Juice Heater Control

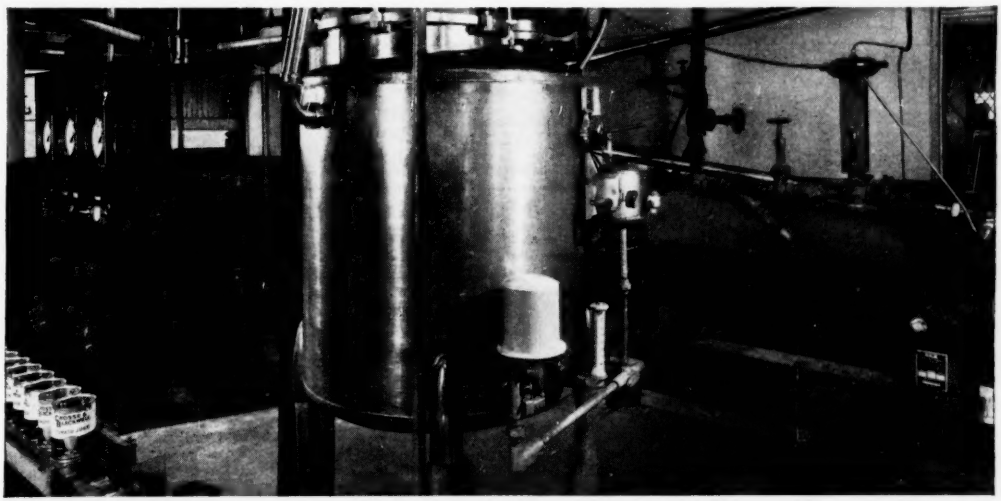
BELOW is a new Chain Belt Juice Heater at Crosse & Blackwell's big plant near Baltimore. The unit is a combination pre-heater, sterilizer, regenerator, cooler and deaerator. Masterminding the operation is that panel of Taylor Fulscope* Recording Controllers, left.

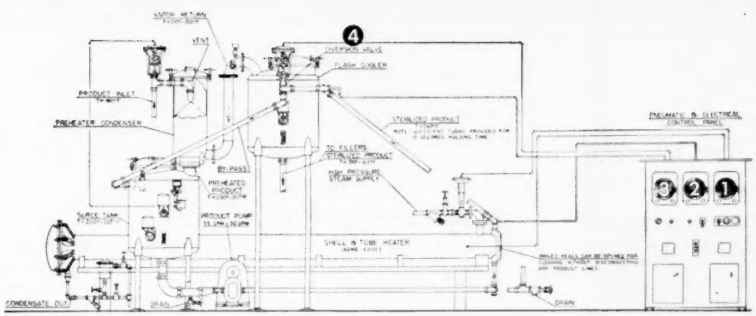
Lower costs and greater product uniformity have resulted from the unique control system which has minimized shut-downs to remove "burn-on". Special over-ride pressure control holds steam pressure at a minimum during critical start-up period, compensates for accumulated "burn-on" as it takes place. With pasteurization outlet temperatures held within ±1° F., more uniform flavor, appearance, and maximum production capacity are assured. This high accuracy of control results from the Taylor High-Speed Sanitary Thermal System (thermal lag of 2 seconds or less), the time-proven Fulscope Controller mechanism, and plenty of know-how in applying instrumentation to food processing problems.

You can get this kind of accuracy from properly selected and adjusted Taylor Control Systems. Your Taylor Field Engineer will give you full details on controls for juice heaters and many other food processing units: Blanchers, Lye Peelers, Exhausters, Retorts, Continuous Cookers, Cooling Canals, Deaerators, Jam and Jelly Kettles, etc. Write for catalog 500! Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

* Registered Trade-Mark

Instruments for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level.





ABOVE: Taylor Fulscope Recording Temperature Controllers (left) on new Chain Belt Juice Heater (right) at Crosse & Blackwell's big plant near Baltimore. Results—uniform juice quality at lowest possible heating cost.

LEFT: Shell steam pressure is automatically controlled by Recording Pressure Controller (1), the control point of which is reset by Recording Temperature Controller (2) having its temperature-sensitive bulb in sterilizer outlet.

In event of improperly heated product, Controller (3) actuates Diversion Valve (4) to return product for re-heating.

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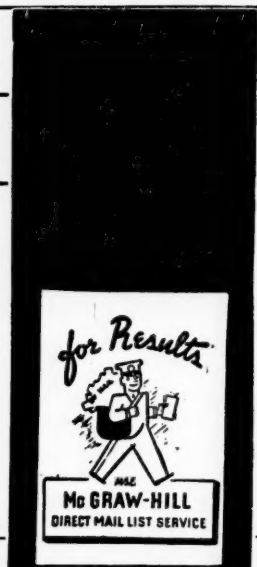

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Market milk and cream, butter, domestic and foreign-type cheeses, fermented, condensed and dry milk, and ice cream and related products are dealt with fully in terms of controlling growth of helpful and harmful microorganisms at every stage of production, processing and distribution.

Latest sanitation procedures are detailed, showing proper methods of cleaning dairy farm and plant equipment, effectiveness of various germicides, etc. You get a full explanation of tests used to determine sanitary quality, and discussions of diseases borne by milk and milk products.

Just Published

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Numerous illustrations and original photomicrographs make explanations crystal clear. Schematic diagrams are used instead of formulas to simplify the chemistry of compounds attacked and decomposition products derived. Wherever possible, data are presented in simple table form.

Highlights of this manual

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- ▶ fermented milk manufacture
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- ▶ phosphatase tests
- ▶ prevention of disease borne by milk, milk products
- ▶ improving butter and cheese starter cultures.
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Financial responsibility unlimited.

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1—2000 gal. Steel, Jacketed Kettle, open top, Agitated, 7' dia. x 7'6" deep.
1—Anco 3' x 6' Chilling Roll, M. D.
1—Louisville Steam Tube Dryer, 6' x 50'.
1—Rotary Vacuum Dryer, 5' x 33".
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1—Screw press extractor 12" dia x 5' long.
1—Aluminum Reactor, 1000 gal., jkt., coils, agit.
15—Stainless Clad Kettles, 40# jkt., 60 & 80 gal.
10—Stainless Kettles, 100# jkt.—50 to 500 gal.
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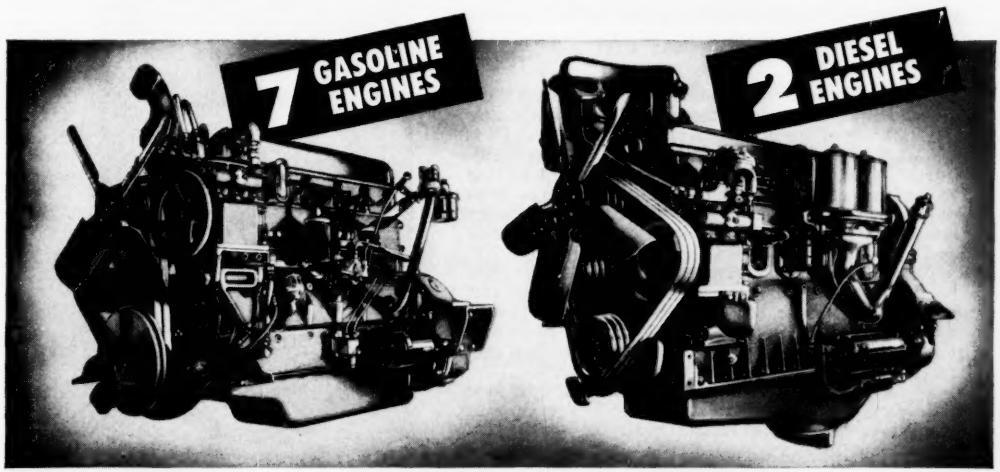

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YOUR FOODS CAN HAVE

A DRAMATIC "EDGE" IN FLAVOR

Unusual new product—*Ac'cent*—intensifies the flavor of food, definitely combats "flavor-loss"... at remarkably low cost

At no obligation to you—quickly—easily, we can show you the surprising improvement a bit of Ac'cent makes in the flavor of *one of your own foods!*

You be the judge . . . and prepare to be astonished!

You've probably heard about Ac'cent. New as it is to general use, its amazing effectiveness has been proven over and over again. Its economy is being established every day in certain food processing plants and in famous dining places.

Ac'cent is not a flavoring, not a condiment. It adds no flavor, aroma or color of its own. It simply, but wonderfully, brings out—and *holds*—the NATURAL flavors of foods. With Ac'cent, you use your own formulas. You prepare and cook as usual—just add Ac'cent.

Write or phone for information. Our staff of food technologists is on call to discuss with you in your plant the possibilities of Ac'cent in the foods you pack.

Amino Products Division
International Minerals & Chemical Corp.
20 North Wacker Drive, Chicago 6, Illinois

Ac'cent is a 99+% pure monosodium glutamate, derived from vegetable sources. It is a wholesome product of Nature. In 100 and 200 lb. drums.

Ac'cent® makes food flavors sing!

Trademark "Ac'cent" Reg. U.S. Pat. Off. Printed in U.S.A.

Gaylord Boxes

-assure safe delivery of your product

. . a safer trip from factory to consumer

You want your product delivered to the user in the best possible condition.

You want it carefully protected through all the channels of distribution which it must travel — whether by train, truck, plane or ship.

You want your shipping containers and packages to reflect the quality of your product and to build sales.

To avail yourself of these advantages, call the nearest Gaylord sales office.

Corrugated and Solid Fibre Boxes

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Kraft Paper and Specialties

Kraft Bags and Sacks

Call your nearest Gaylord Sales office

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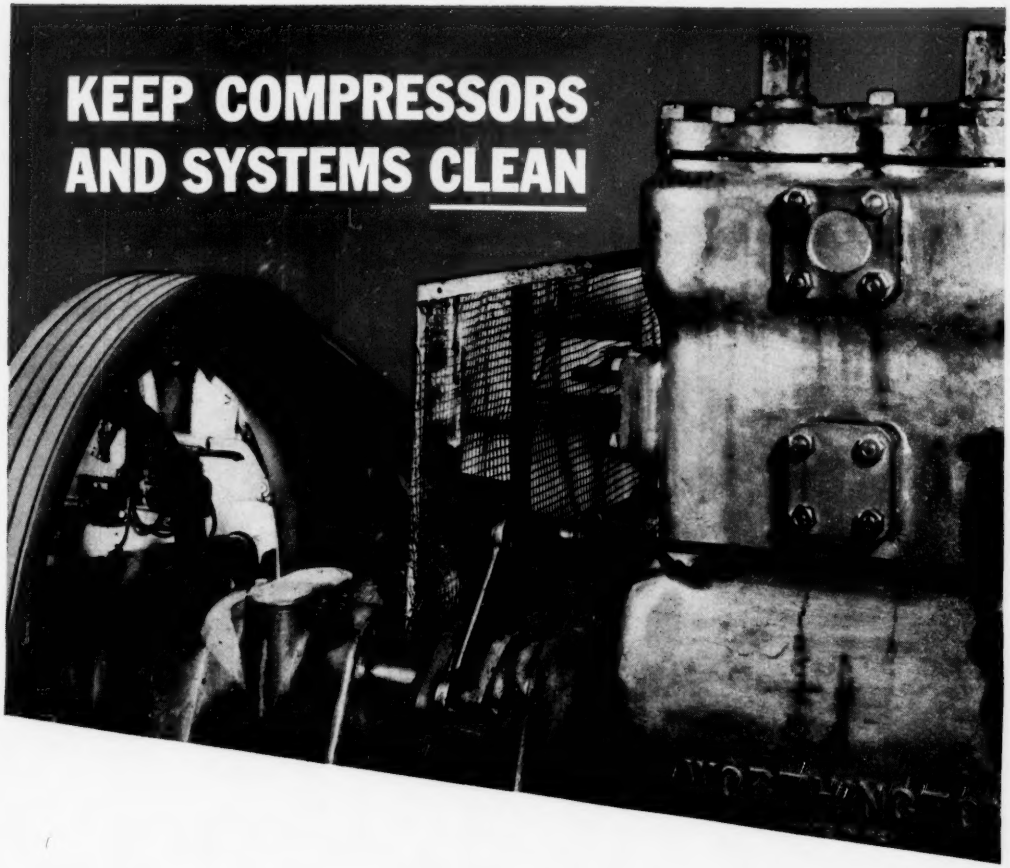
KEEP COMPRESSORS AND SYSTEMS CLEAN



Use the lubricant that assures efficient operation Texaco Capella Oil

WHATEVER type or size of refrigerating compressor you are operating, you can get maximum output from it, at the lowest possible operating and maintenance cost, by lubricating with *Texaco Capella Oil.*

Texaco Capella Oils are highly refined lubricants . . . moisture-free . . . non-reactive with refrigerants, very low pour test. They have very high resistance to oxidation, gumming and sludging . . . keep compressors clean . . . help increase the efficiency of the whole system.

You can get *Texaco Capella Oils* in every needed viscosity. Let a Texaco Lubrication Engineer recommend the right ones for your particular operating conditions. Just call the nearest of the more than 2300 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO Capella Oils

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